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THE UNIVERSITY OF ALBERTA

GENERAL ANXIETY, DESENSITIZATION AND THE HIERARCHY

BY

ROGER A. DAVIS (C)

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Desensitization Hierarchies-Test Anxiety And General Anxiety" submitted by Roger Allan Davis in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

In this study the effect of presenting the fear-items of the hierarchy in a reversed, high-to-low, order was examined and the relationship of the subjects' general-anxiety level on the outcome of systematic desensitization was examined.

During September Registration, all first-year students in the Faculty of Education at the University of Alberta were requested to complete Cattell and Scheier's Anxiety Scale Questionnaire and Suinn's Test Anxiety Behavioral Scale. Subsequently, those 274 students scoring above the mean on the test-anxiety measure were assigned to one of two treatment groups: a standard hierarchy treatment, which presented the hierarchy fear-items in the usual low-to-high order; and a modified hierarchy treatment, which presented the fear-items in a reversed, high-to-low order within each treatment session. Sixty-one subjects volunteered for the two treatments and 65 non-motivated, no-treatment subjects volunteered for follow-up testing. Treatment by level ANCOVA's were employed to the retested test-anxiety scores at post and follow-up times. Subjects were characterized as possessing high or low general-anxiety on the basis of the Anxiety Scale Questionnaire Total, Overt and Covert scores.

Immediately following treatment the post-analysis revealed that the application of the standard hierarchy treatment produced

superior test-anxiety reduction. However, at four month follow-up the analysis revealed no overall main effects due to treatments even though two interactions indicated that the high-covert general-anxiety subjects exposed to the reversed hierarchy treatment demonstrated significantly more test-anxiety reduction than the low-covert general-anxiety subjects. The writer concluded that these findings mitigated against the acceptance of previous writers' conclusions that the hierarchy is unimportant to the process of desensitization.

Sufficient evidence was also found at both post and follow-up analysis to conclude that high general-anxiety subjects showed superior test-anxiety reduction. However, these results indicated that this relationship is complex, as the significant differences found were dependent upon the Overt general-anxiety scale at post-analysis and the Covert scale of the Anxiety Scale Questionnaire at follow-up analysis. These differences were less evident when employing the Total scores. The writer concluded that the Overt and Covert scales of this instrument are not additive and are measuring some unknown phenomenon which differentially effects the desensitization process.

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CHAPTER I

INTRODUCTION

The use of systematic desensitization as a psychotherapeutic technique has grown rapidly since its introduction by Wolpe (1958) and currently enjoys widespread popularity among many mental health disciplines. While the effectiveness of the procedure in reducing some specific anxieties is unquestionable, the bulk of the research on the specific procedures to be followed as prescribed by Wolpe is confused. One of these procedures, is the ordering of the fear-items of the hierarchy. This study proposes to examine a desensitization treatment of test-anxiety in which the ordering of the fear-items has been modified. Similarly, the literature indicates a great deal of confusion with regards to the extent that general, free floating, anxiety may interact with the desensitization of test-anxiety. The secondary purpose of the present study is to examine to what extent general-anxiety may interact with the desensitization of test-anxiety.

While many psychologists recognize that anxiety is the most pervasive psychological phenomenon of our time and that it is the chief symptom in neuroses and functional psychoses, there has been little or no agreement on its definition, measurement, or treatment (Hoch & Zubin, 1950). Prior to 1950, little research had been

conducted on anxiety. During the following fifteen years, over 3,500 articles or books related to anxiety were published (Speilberger, 1966). The sheer volume of empirical research now available precludes any attempt at summarization. However, selective reviews of important segments of this literature are available (Haggard, 1949; Hanfman, 1950; Krause, 1961; Lazarus, Deese and Osler, 1952; Malmo, 1957; Martin 1961; Sarason, 1961; Spence, 1958; Taylor, 1956).

Indicative of the conceptual ambiguities found in the literature is Cattell and Scheiers' (1963) report, which relates that those researchers counted more than 120 personality-type tests and 325 different variables presumed to relate to some aspect of anxiety. In an effort to resolve this conceptual confusion they have attempted to develop theory-free factor-analytic-derived measures of anxiety.

Concurrently, advances have been made in treating anxiety; most notably through the development of systematic desensitization treatments (Wolpe, 1952, 1954, 1958). Proponents of systematic desensitization claim that it is one of the most effective new therapeutic methods. Wolpe's theoretical formulations are still seriously questioned and evidence for clinical effectiveness of his treatment rests primarily on case study methodology. Accumulated laboratory evidence has, however, convincingly demonstrated the effectiveness of systematic desensitization in reducing anxiety (Davison, 1968; Gelder, Marks, Wolff & Clarke, 1967; Lang & Lazovik, 1963; Paul, 1968). Recent reviews of the literature (Krasner, 1971; Marks & Gelder, 1965, 1968; Rachman & Hogdson, 1967) conclude that no further research is necessary to demonstrate the effectiveness of these procedures and that research should now focus upon idiographic variables and variations of technique

which may be responsible for differential treatment effects. The findings of a recent experiment conducted by Melamed (1969) suggest one such variation of technique (the manipulation of the ordering of fear-items in the phobic hierarchy) and one idiographic variable (general anxiety) which may be related to the outcome of systematic desensitization.

Wolpe (1970) considers three conditions essential for achieving counterconditioning based upon his reciporcal inhibition principle, which says: "If a response inhibitory of anxiety can be made to occur in the presence of anxiety-evoking stimuli, it will weaken the bond between these stimuli and anxiety" (p. 15). First, it is necessary to select an anxiety-neutralizing stimulus capable of inducing a competing condition of sufficient strength to overcome the neurotic reactions usually evoked by the emotion-arousing cues. Second, the anxiety-arousing events must be presented initially in a sufficiently weak form so that the emotional responses to be counteracted can be readily extinguished. These weaker forms of the anxiety-arousing events are arranged in hierarchial order, from the item eliciting the least to that eliciting the most amount of anxiety. The third condition requires the anxiety-inhibiting response be contiguously paired with each of the aversive hierarchy items.

Wolpe's rationale for the necessity of utilizing a graduated hierarchy of fear-items rests upon an explanation based on stimulus generalization. In the counterconditioning paradigm the pairings of anxiety-competing responses with a low fear stimulus presumably enables persons to progressively tolerate higher levels of threat without responding anxiously (Davison, 1968). Implosive Therapy (Stampl

& Levis, 1967) and other treatments utilize the repeated presentation of the most feared situation at the outset. These treatments have brought into question Wolpe's assumption that a graduated presentation of aversive stimuli is a fundamental requirement of desensitization. This question has not been systematically investigated (Bandura, 1969).

An experiment by Melamed (1969) attempted to evaluate the effects of cognitive induced sets upon verbal responses to filmed fear stimuli. This included treatment groups analogous to systematic desensitization. Part of her design had treatment groups which were presented fear stimuli in a high-to-low order. An unexpected finding indicated that the systematic desensitization groups demonstrated more fear reduction when presented with the hierarchy items in a high-to-low order than those groups presented with the low-to-high hierarchies. This result is in conflict with Wolpe's rationale. The present study investigates the effects of presenting the items in the high-to-low order within each systematic desensitization session.

A second result of the Melamed experiment revealed that a relationship existed between the individuals' pre-tested basal rate of habituation to non-fearful stimuli and to fearful stimuli. Individuals who were high habituators, indicative of low general-anxiety, showed more post-experimental fear change than individuals who were low habituators. Other writers (Glick, 1970; Lazarus, 1965; Wolpe, 1969) have proposed that individuals' level of general-anxiety may be associated with different results when using systematic desensitization.

Lang (1964) reported a moderate negative correlation between pre-tested general anxiety scores and subsequent reduction of a public reaction. Commenting on these results, Wolpe (1964) stated that he

would anticipate poorer results using desensitization with generally anxious persons than with persons whose anxiety is specific to a particular activity or situation.

While the literature is replete with empirical studies on the interaction of anxiety and various types of learning tasks, little evidence has been accumulated to explore this relationship with systematic desensitization. In this study the relationship between general anxiety and desensitization will also be examined.

CHAPTER II

RELATED LITERATURE

Proponents of systematic desensitization have claimed that it is one of the most consistently effective therapeutic methods available for the reduction of anxiety. While the theoretical formulations of desensitization have been seriously questioned (Breger & McGaugh, 1965; Davison, 1968; Lader & Mathews, 1969, Lang, Lazovik & Reynolds 1965; Lomont, 1965; Valins & Ray, 1967; Wilkins, 1971) and evidence for its clinical effectiveness has rested primarily on case study methodology (Burnett & Ryan, 1964; Hussain, 1964; Lazarus, 1963; Wolpe, 1958) there have been clear laboratory and quasi clinical demonstrations of its effectiveness (Cooke, 1968; Davison, 1968; Gelder, Marks, Wolff & Clarke, 1967; Lang, Lazovik & Reynolds, 1965; Marks, Sonada & Schalock, 1968; Paul, 1966, 1967, 1968, 1969a, 1969b).

The following review makes no attempt to encompass the broad spectrum of literature pertaining to systematic desensitization, but restricts itself to a selection of writings pertinent to the two questions of this investigation: (1) the effect of changing the order of the test anxiety items in the fear hierarchy during group desensitization, and (2) the effect of the subjects' level of general anxiety on the outcome of desensitization used to reduce test anxiety.

The first section of this chapter focuses on a consideration of the fear-item hierarchy. The historical development of the popularly used low-to-high fear-item hierarchy (standard hierarchy) will be presented, followed by a report of empirical studies related to reversing the items in the fear hierarchy (reversed hierarchy). Next, a cognitive explanation of how desensitization is effective will be

presented. Lastly, the modified hierarchy to be utilized in this investigation will be described and its rationale provided.

The second section of the chapter will examine the literature pertaining to the relationship between general or free-floating anxiety and treatment by desensitization for test (specific) anxiety. A definition of general anxiety derived from factor-analysis will be presented, followed by a discussion of state versus trait anxiety. Then the investigator will consider the theoretical and empirical literature which suggests that individual differences existing in the level of general anxiety may be related to the effectiveness of systematic desensitization for test anxiety.

The final section of the chapter will present the formulated hypothesis.

The Graduated Hierarchy

Historical Development

Behavioral therapists believe that the development, elimination, or modification of behavior can be explained by experimentally established principles of learning. Within this framework, the origin of all but the most reflexive of behavior has been viewed as a result of the individual's past cummulative history of stimulus-response associations. Further, the treatment for inappropriate behavior by behaviorists has focused upon discovering and modifying the stimulus-response bonds underlying the neurotic response. The two most common strategies utilized are (1) to arrange for the neurotic response to occur in conditions which are not reinforcing (extinction), and (2) to arrange for the learning of a new adaptive response which has stronger reinforcing value (counterconditioning). Wolpe's

desensitization procedures have most commonly been explained by utilizing a counterconditioning paradigm which attempts to condition a new adaptive response to stimuli eliciting the neurotic responses.

Wolpe (1970a) has attributed the conceptual origin of his method to the works of Watson and Raynor (1920), Jones (1924a), Pavlov (1927), Guthrie (1935) and Masserman (1943). Watson and Raynor's (1920) famous Little Albert experiment demonstrated that neurotic fear could be conditioned. It further indicated that the conditioned fear might be eliminated by any one of four techniques: (1) experimental extinction; (2) constructive activities performed around the feared object; (3) reconditioning through feeding a child candy in the presence of the feared object; or (4) procuring competition with fear by stimulating erogenous zones in the presence of the feared object. The last three of these suggestions were regarded as applications of a counterconditioning paradigm (Wolpe, 1970). Later, Jones (1924b) successfully applied the technique of reconditioning by feeding a child candy in the presence of a phobically feared animal. Jones utilized a graded "in vivo" hierarchy; distance from the feared animal.

The result of Jones' experiment seemed to have gone unnoticed as the dominant methods of treating experimental neuroses over the following 20 years were based upon extinction techniques (Wolpe, 1970a). It was not until 1935 that Guthrie noted the general therapeutic applicability of the counterconditioning method that Jones had demonstrated. At that time, he stated that the simplest rule for breaking a habit is "to find the cues that initiate the action and to

practice another response to these cues" (p. 138). However, it was left to Masserman (1943), with his well known experiments with cats, to demonstrate the general effectiveness of utilizing food to overcome experimental neuroses.

In his own animal experimentation, Wolpe adopted Masserman's designs and noted that many of the animals with induced experimental neuroses chose to starve rather than eat (Wolpe, 1958). This led Wolpe to explore the hypothesis that the strength of the neurotic response would increase as the environment to which the animal was exposed became more similar to that of the environment in which the neurotic response had been generated. By presenting the animals with initial stimuli remote from such an environment, animals who earlier had failed to extinguish the neurotic responses were successfully treated.

Wolpe desired to establish that human neuroses are parallel to experimental neuroses in respect to their acquisition by learning and elimination by reconditioning. He attempted to establish the historical antecedents of the "symptoms" in clinical cases of neuroses. Wolpe concluded that neurotic reactions whose origins could be traced to traumatic experiences would be brought about first by stimuli similar to those in the fore-front at the time of the experience and later by other stimuli which become effective through second-order conditioning (Wolpe, 1958).

> As in animal neuroses, their (human neuroses) response is determined by the degree of similarity of the evoking stimulus to a zenithal stimulus that is often identical with the original conditioned stimulus. In a particular case, there may be several physically unrelated classes of anxiety-arousing stimuli, each of which is found on examination to have a zenith and a generalization gradient. The ranked members of a gradient constitute a hierarchy. (Wolpe, 1970a, p. 9)

Hence, in Wolpe's method, the utilization of a hierarchy of fear stimuli has been essential. Therapists utilizing the method have devoted considerable time and energy to discovering, ordering, and designing graduated hierarchies of fear items prior to the commencement of treatment. The nature of the hierarchy itself has received surprisingly little attention by researchers to date.

The question of whether a graduated presentation of fear stimuli is a fundamental requirement of desensitization had not been systematically investigated. If the processes of elimination through extinction treatments and systematic desensitization are analogous, then reductions in anxiety can be achieved either by the re-exposure to progressively more threatening events or by the repeated confrontation with the most feared situation at the outset.

Recently, a performance extinction treatment, Implosive Therapy (Stampl & Levis 1967), utilized the repeated exposure to the most feared events. This method has been associated with eliciting high levels of anxiety. This contrasts with Wolpe's method which attempts to minimize the amount of anxiety elicited. Implosive Therapy has proven to be successful with some people. This raises the question as to the need for and a form of a graduated hierarchy. Since Implosive Therapy has been associated with eliciting high levels of anxiety, little research has been carried out on human subjects. In utilizing phobic subjects in a laboratory setting where the number and length of sessions and other variables are not uniquely designed for the individual, the procedure might exacerbate the treated disorder, thus raising ethical concerns. Aside from the above considerations, it will be remembered that this very problem--the elicitation of high anxiety--led Wolpe to

incorporate the graduated hierarchy as an essential ingredient of his technique. Both Schubot (1966) and Wolpe (1963) have reported that there appears to be an inverse relationship between the number of scene presentations (the frequency of anxiety responding) and the degree of anxiety reduction.

Since the inception of the present study, recent research has led some psychologists to conclude that the importance assigned to hierarchy construction and the rules for progressing through the hierarchy as prescribed by Wolpe are invalid. Cotler (1970), Donner and Guerney (1969), and Payne (1972) have found that group hierarchies (a standard pool of fear items) are effective and when compared to individualized hierarchies are equally as effective. Ihli and Garlington (1969), McGlynn (1971), Cohen (1969), Suinn, Edie, and Spinelli (1970) found that desensitization was equally effective when presenting only the upper half of the hierarchy when compared to the full hierarchy presentation. Miller and Nawas (1970) report that it appears unnecessary to reduce completely the anxiety associated with a particular item before proceeding to the next higher feared item.

Other studies can be found that provide contradictory evidence. Edelman (1971) has shown that repeated presentation of a high-fear stimuli does reduce autonomic nervous system reactivity. Lomont and Brock (1971b) reported evidence which supports Wolpe's claim that reduction of anxiety to one item in the hierarchy does generalize to the adjacent items. Proctor (1969), provides data indicating that the repetition frequency of an item and the duration of its exposure time are both important factors in hierarchy presentation.

The Reversed Hierarchy

The findings of an experiment by Krapfl (1967) are of direct relevance to the issue of manipulating the hierarchical ordering. Snake-phobic subjects received semi-automated systematic desensitization and were presented with the fear items in one of three orders: (1) an ascending arrangement from least to most anxiety arousing (the standard procedure); (2) a descending arrangement from most to least anxiety arousing and (3) a random order. In addition, one control group received no treatment and a second was presented with snake-irrelevant stimuli. The only significant result found was that the randomized procedure produced consistently weaker effects. Although desensitization that proceeded from most -to-least aversive items proved effective, it initially elicited high levels of emotional responding and negative reactions to the total procedure. The researchers concluded that in clinical applications, this method is likely to run the risk of client termination before the completion of treatment. The proposed experimental treatment of the present study reverses the fear items only within each treatment session. This proposed hierarchical ordering was generated from the outcome of an analogue study by Melamed (1969).

Melamed's study examined the ordering effect of presented fear stimuli and the effect of an induced cognitive set upon autonomic and verbal responses to filmed fear stimuli. The presentation ordering of the high-to-low-fear stimuli was mixed as a design control variable. Some groups were presented with the high-fear stimuli followed by the low-fear stimuli. Additionally, the experiment explored differences between an instructional set designed to relax and a set designed to experience fully an emotional response. Separate groups of subjects

were given three different instructions for viewing the film series: (1) experience catharsis--subjects were instructed to imagine they were actively participating in the events on film and to experience the full force of their emotions; (2) aim at relaxation--subjects were instructed to vividly experience the events but to remain as relaxed as possible; (3) attend--subjects were instructed to just attend closely to the filmed stimuli with no particular set described. The combination of relaxation with low-to-high fear stimuli presentation is analogous to a desensitization treatment.

The experimental results suggested the instructions significantly affected autonomic activity and self reported fear. Subjects instructed to fully experience emotion without aiming at relaxation showed the most fear related behavior. Individuals in the relaxation set showed the most and fastest rate of fear reduction thus supporting the contention that relaxation plays a critical role in desensitization. The set condition and the order of presentation of fear stimuli were found to interact with the relaxation instructions, producing differential fear change. This result was unexpected. When the low-fear items were presented first, no significant differences in fear changes between set groups were observed. However, when the fear stimuli were presented in a high-to-low order, the relaxation-set groups (desensitization groups) showed significantly greater reduction in verbally reported fear measures than did either the catharsis- or attend-set groups. This high-to-low hierarchy order was also associated with a lower average rating of fearfulness towards each film. Autonomic measures indicated that subjects in the relaxation groups showed fear responses to each film which were significantly lower when the films were presented in high-to-low fear order.

Reverse results were recorded for individuals in the catharsis groups.

The Melamed results have important implications for the treatment context. Fear reduction through the high-to-low ordering of the fear stimuli was unanticipated and at variance with the rationale usually given for employing an anxiety hierarchy which is arranged with a low-to-high ordering. As previously mentioned, Wolpe (1958) has postulated that forward generalization from successfully desensitized lower-fear items reduces the habit strength of more intense fear items in the hierarchy, thus rendering the more frightening items amenable to counterconditioning. However, Melamed's subjects tended to judge the stimuli presented first, to be near the middle of a subjective scale of fearfulness. When succeedingly lower fear stimuli were presented, she proposed that the contrast effect drove the judgment of the second stimuli further down the fear scale. In addition, the data suggested that low-fear stimuli, which usually show little decrease in fearfulness, showed greater decrease in fearfulness when presented after a high-feared item. This last result prompted Melamed to hypothesize a cognitive explanation; that the subjects "were learning to learn a set to show fear reduction" (ibid, p. 160).

The Cognitive Model

The general proposition that systematic desensitization might usefully be construed in terms of cognitive processes was originally enunciated by London (1964). He proposed that desensitization derived its effectiveness through the modification of a person's thinking and expectancies about the feared situation. Experimental research along cognitive lines began with the investigations of Kaufman, Baron and Kopp (1966), Valins (1966) and Valins and Ray (1967) within the social

psychological framework of attribution theory.

Valin's interpretation of desensitization derived from Schachter and Singer's (1962) theory of emotional behavior, which holds that emotions are the conjoint product of both physiological arousal and cognitive (perceptual) factors. According to this formulation, physiological arousal provides a nonspecific basis of emotion; the quality of emotion the individual experiences is said to be a function of how the person explains to himself the reasons for the arousal. This has given rise to the proposition that if an individual can be manipulated to believe that his emotional state (physiological arousal) is the result of something else, he will relabel and change the emotional experience. Valins and Ray (1967) extended this proposition by suggesting that actual autonomic arousal might be unnecessary in order for emotional reactions to be influenced. They proposed that this can occur if the individual believes he is aroused, even if this is not true. Accordingly, Valins (1966) reasoned that subjects might be induced to believe that they were reacting nonfearfully in the presence of a phobic stimulus and thereby relabel that stimulus as nonthreatening and subsequently behave less fearfully. Valins and Ray (1967) investigated this possibility in two closely related studies. In these studies, they suggested that false feedback acted in a manner analogous to relaxation in systematic desensitization, which, they proposed, might derive its effectiveness by inducing the cognition that the previously fear eliciting stimulus no longer retained its aversive properties. This novel interpretation of systematic desensitization has attracted considerable attention as an alternative to the more conventional accounts. Murray and Jacobson (1971) state that these

studies strongly demonstrated "that the crucial factor in desensitization therapy is a change in belief about the self--similar to that occurring in traditional therapy--rather than the mechanics of relaxation, hierarchies, images, and so on" (p. 716). Valins and Ray (1967) more properly point out that "it is not possible to conclude that successful desensitization therapy is based upon the inductions of these cognitions" but they do conclude that "cognitions about internal reactions are important modifiers of behavior" (p. 349), and suggest that the kind of cognitions produced by the false feedback might be responsible for successful desensitization.

One such cognitive variable that may be amenable to manipulation is the perception of the emotions aroused by the items in the fear hierarchy. In research on absolute judgments, one of the most characteristic features of discrimination data obtained by the method of absolute judgments is the prominent anchor effect obtained for the stimulus on the ends of the continuums. A theoretical explanation for the anchor effect has been suggested by Eriksen and Hake (1957). Their Subjective-standard Hypothesis reasons that "judgments are never made in a vacuum but are always made relative to a standard or reference level that is subjectively present (p. 133). Subjects select a few stimuli in the series at the ends of the continuum to use as standards for judging the remaining stimuli. Research based upon the Subjective-standard Hypothesis has found that when subjects choose one end of the continuum as a reference point, succeeding judgments tend to be judged as farther away from the reference standard. Melamed suggested that this cognitive effect produced the observed outcome in her 1969 study. In Melamed's eyes, the effect of presenting a

highly feared stimulus first pushed the subsequent presentation of a lower fear stimuli even further down the subjectively judged scale of fearfulness. Therefore, if cognitive factors (perceptual factors) play a part in relabelling the fearfulness of an item, the presentation of a high fear hierarchy item first in desensitization may facilitate fear reduction to the subsequently presented items of lower fear value.

The Experimental Hierarchy

Applied to the standard Wolpean procedure, the Subjective-standard Hypothesis suggests the utilization of a completely reversed hierarchy. However, previous research by Krapfl (1967) indicated that the subject's negative emotional reaction to the procedure mitigated against its use. Therefore, the present study proposed to design hierarchies which reverse item presentation within each treatment session rather than over the entire hierarchy. If one treatment session includes three items, they will be reversed. Within each treatment session, the items would be reversed but between each treatment session, the items would remain in the low-to-high ordering. This procedure intends to avoid the strongly negative reaction noted by Krapfl, yet produce the effect observed by Melamed.

General Anxiety

Definition

The term "anxiety" has long been a key construct in psychological theorizing. However, despite an impressive amount of study, the term has often been poorly defined; either very narrowly or so general as to encompass almost any unpleasant affect. As a consequence, there is a great deal of inconsistency in the related body of reported

empirical findings and in the analyses of the role of anxiety in behavior (Spielberger, 1966). Speigler, Morris and Liebert (1968) have attributed much of this confusion to the fact that most of the research is based upon a unitary concept of anxiety, which continues to be used even though researchers (Cattell, 1956a, 1956b; Hedl, 1972; Jackson & Bloomberg, 1958; Martin, 1971; Sarason, 1960; Sassenrath, 1964; Sassenrath, Kight & Kaiser, 1965; Spiegler, Morris & Liebert, 1968) using factor analytic techniques have demonstrated that several distinct factors are subsumed under the term "anxiety".

Cattell (1957) has viewed factor analysis as the "touchstone" capable of leading scientifically minded researchers out of the abyss of this theoretical and empirical confusion. Essentially, he proposed pooling all known personality questionnaire items, factor analyzing them, and only then utilizing theoretical constructs to explain the observed factors. Utilizing his own proposal, Cattell (1963) and Cattell and Scheier (1961) purport to have identified general anxiety as a unitary second-order factor (factor UI 24) which subsumes a number of other first-order factors. They claim that this superordinate factor is independent from neuroticism, the other second-order factor found in their analyses. In addition, they have provided evidence that this anxiety factor is independent of other states, such as effort-stress and fear (specific anxiety). By studying the factor loadings and the correlates of UI 24, Cattell (1957) has postulated that general anxiety arises from a threatened deprivation of an anticipated satisfaction when the threat does not carry complete cognitive certainty. This investigator has accepted Cattell's definition of general anxiety and utilized Cattell's factor

analytically derived instrument (Cattell's Anxiety Scale Questionnaire) as the operational definition of general anxiety.

State versus Trait Anxiety

Another more recent factor-analytic study of anxiety by Johnson and Speilberger (1968) demonstrated that two constructs exist under the loose term "anxiety". They have labelled these constructs as "A-state" anxiety and "A-trait" anxiety. "A-state" anxiety is an organismic transitory state of apprehension and tension as a reaction to a specific stress, while "A-trait" anxiety refers to the degree to which individuals are disposed to manifest "A-state" anxiety in response to various forms of stress. Viewed in this manner, A-state anxiety fluctuates over time, while A-trait anxiety is stable.

Mitchell and Ingram (1970) utilizing Johnson and Spielberger's findings (1968) assumed that test anxiety is a specific situational (A-state) anxiety. They hypothesized that A-trait anxiety (general anxiety) would influence the process and outcome of desensitization of test anxiety (A-state anxiety). The rationale for their hypothesis was that A-trait anxiety, as a personality trait, disposes individuals to manifest A-state anxiety (specific anxiety) in response to various forms of stress. Contrary to their expectations, Mitchell and Ingram found no significant differences in test anxiety reduction between high and low general anxiety subjects. They concluded that the process and outcome of desensitization were not differentially influenced by the presence of high general anxiety. Two difficulties inherent in the Mitchell and Ingram study, may have been (1) their assumption that test anxiety is an instance of state anxiety and (2) their assumption that test anxiety is a unitary concept. Each of these difficulties

will be discussed in turn.

Hedl (1972) attempted to relate test-anxiety measures and measures of trait-state anxiety by manipulating the evaluative stress surrounding a test situation. His hypothesis that state-anxiety measures during evaluative situations would be most similar to test-anxiety was not supported. A succeeding analysis indicated strong support for a close relationship between trait-anxiety and test-anxiety and, secondly, for test-anxiety to not be sensitive to temporal fluctuations in intensity under evaluative stress. These findings have been interpreted as indicating that test-anxiety, while a specific situational measure of anxiety, is related to trait-anxiety and not to state-anxiety. Some peripheral support for this hypothesis has been obtained from studies which indicate that the reduction of phobic anxiety through desensitization is accompanied by a concurrent reduction in trait-anxiety as measured by Cattell's ASQ (Payne 1972).

Following the reasoning of researchers who are proponents of the factor-analytic approach to understanding general anxiety, Sassenrath (1964) and Sassenrath, Kight and Kaiser (1965) factor analyzed test anxiety measures to determine if test anxiety was a unitary concept. They found two major classes of factors which Liebert and Morris (1967) labelled "worry" and "emotionality". Liebert and Morris (1967) identify "worry" as the cognitive or intellectual concern about one's own performance, while the second factor, labelled "emotionality", they identify as the specific reactions to the stress of the examination situation <u>per se</u>. Studies by Spiegler, Morris and Liebert (1968) have provided strong support for Liebert and Morris' hypothesis that

the "emotionality" components of test anxiety measures are primarily a function of stressful test situations, while the "worry" components are not. In this light, the "worry" components have been viewed as being related to trait-anxiety, while the "emotionality" components have been related to a state-anxiety factor.

Consequently, for the purposes of the present study, it was considered important to examine the test anxiety instrument (Suinn's Test Anxiety Behavioral Scale) for the presence of subordinate factors. If the emotionality and worry factors are present, then their correlates to the factors within Cattell's general (A-trait) anxiety measure might provide descriptive data to illuminate the relationship between test-anxiety and general anxiety. The investigator suggests, as Mitchell and Ingram (1970) did, that general anxiety may have a differential effect upon the outcome of desensitization for test anxiety if the factors subsumed by test anxiety are examined.

General Anxiety and Desensitization

One purpose of the present research was to investigate the influence of A-trait or general anxiety in facilitating or impeding the reduction of test anxiety by short term group desensitization treatment. A review of the literature on the relationship between general anxiety and treatment by desensitization reveals inconsistent findings. Lang (1964) reported a high negative correlation between initial scores on a measure of general anxiety and the amount of reduction of a phobic response. Commenting on these results, Wolpe (1964) stated that he would anticipate poorer results using desensitization with generally anxious persons than with persons whose

anxiety is experienced only in relation to a particular activity or situation. Lazarus (1965) and Wolpe (1969) discussed the use and modification of desensitization procedures to accomodate the believed negative relationship between high general anxiety and systematic desensitization. Glick (1970) has attributed failure to achieve the elimination of a phobia following desensitization to a high level of general anxiety. His attribution is in accord with other clinical reports, which suggest that the presence of high general anxiety impedes, or entirely prevents the process of desensitization (Eysenck & Rachman, 1965; Lang & Lazovik, 1963). Paul (1966) and Mitchell and Ingram (1970) however, did not find the level of general anxiety to be of importance to the outcome of desensitization. Suprisingly, Cooke (1966) reported that fear reduction of rat phobic subjects was actually greater for high general anxiety subjects than for low general anxiety subjects.

Lader, Gelder and Marks (1967) used physiological measures of general anxiety (habituation rates) to evaluate the effectiveness of desensitization with high-and low-anxious subjects. Among their physiological measures was the rate of habituation of the skin responses evoked by randomly presented pure tone auditory stimuli. The rate of habituation measure was significantly related to the outcome of desensitization. Subjects with a high habituation rate, indicative of lower levels of anxiety, improved more following treatment than did subjects with a low habituation rate. Unfortunately, the criterion for improvement consisted of psychiatric evaluation rather than of more objective measures of outcome. Melamed (1969) also found that a subject's rate of fear reduction was highly correlated to her

individually pretested responsivity to neutral physical stimuli, such as Hertz tones. High habituators (low general anxiety subjects) exhibited superior fear reduction. This has been interpreted as suggesting that individuals bring to the treatment setting, some pre-established mechanism of "conditioning responsivity" (Melamed, 1969, p. 154) which accounts for differential response dispositions to the process and outcome effectiveness of desensitization.

A considerable body of empirical data supports the hypothesis that conditioning is related to general anxiety. Anxious individuals have been found to form conditioned responses more quickly and more strongly than people of average or below-average anxiety (Franks, 1956). Once formed, these conditioned responses are more persistent and less amenable to change. Spence and his associates (1956) have theorized that this occurs because anxiety acts as a drive. Generally, Spence has reasoned that response strength (R) is a function of the excitatory potential of the organism (E), which in turn is a multiplicative function of a learning factor (H) and a generalized drive factor (D). Thus: $R = f(E) = f(H \times D)$ (Spence, 1958). In other words, drive level reflects the emotional responsiveness of the individual. The level of performance reflects the habit strength of a given response multiplied by the drive level. Hence, excitatory potential is partially dependent upon anxiety as a component of some generalized drive to respond.

On this basis, it would be expected that in simple learning situations (one in which the correct response is highest in the habit hierarchy) subjects exhibiting the greatest amount of drive would be expected to perform in a manner superior to others. Conversely, where the correct response is initially low in the habit hierarchy,

the subjects with high levels of anxiety would be expected to perform at a lower level than those with lower drive levels. There is extensive experimental evidence supporting this theoretical position. Spence (1964) reports that 21 of 25 studies bearing upon this issue have supplied supporting evidence for a drive interpretation of conditioning. Generally it has been found that higher general anxiety is associated with faster and stronger initial conditioning of reflexive responses and with more difficulty in extinguishing these responses. With more complex tasks, the opposite results have been found; lower general anxiety is associated with superior performance. These results have important implications for the systematic desensitization learning situation.

Systematic desensitization first conditions the subjects to relax physically, and then, in turn, conditions this relaxation response to each anxiety item in the fear hierarchy. At each stage considerable cognitive activity is required: interpretation of instruction; attendance to physical sensations; and the imagining or visualizing of each hierarchy item. Viewed in this light, Wolpe's procedure consists of a complex learning situation in the context of which general anxiety would play an interfering rather than a facilitative role. In addition, if one assumes that Wolpe's procedure is complex, then the drive-level interpretation of anxiety suggests that the extinction of a conditioned (learned) response would be more difficult to achieve in a person of high general anxiety. This interpretation agrees with the observations from clinical data (Glick, 1970; Lazarus, 1965; Wolpe, 1969). It also agrees with the correlation of higher rates of fear reduction with higher habituation rates (low general anxiety) to neutral stimuli reported by Lader, Gelder and

Marks (1967) and Melamed (1969).

However, if systematic desensitization is viewed as a simple associationistic learning task, then the opposite results could be expected. That is, high general anxiety subjects would be expected to show more specific anxiety reduction than low anxious subjects. Cooke's (1966) findings are supportive of this position. The weight of the literature seems to favor a negative relationship between high general anxiety and systematic desensitization outcome; but the role that general anxiety plays in response to desensitization treatment is not clear from previous research.

Summary and Hypotheses

The present investigation is designed to examine the effect of presenting the graduated fear items of a systematic desensitization procedure in a reversed, high-to-low order within each treatment session. The fear items chosen relate to test anxiety in first year university students. Should the reversed presentation of fear items prove to be more effective than the standard low-to-high ordering in reducing this test-anxiety, then an important modification of the treatment procedure would be indicated.

A secondary purpose of the study, is to examine the effect that a subjects' general anxiety level may have upon the treatment outcome of systematic desensitization. An extensive body of literature indicates that general anxiety interacts with the learning of a new response. The nature of this interaction would appear to be dependent upon both the task difficulty and the amount of stress engendered either by the task, or by the surrounding environment. The empirical data, clinical observations and authoritative opinion bearing on this

issue do not permit the formulation of a directional hypothesis.

The following null hypotheses have been formulated to test these two objectives:

(1) There will be no significant difference in the amount of test-anxiety reduction, as measured by Suinn's Test Anxiety Behavioral Scale, between desensitization employing a standard low-to-high hierarchy and desensitization employing a modified high-to-low hierarchy.

(2) There will be no significant difference in test-anxiety reduction, as measured by Suinn's Test Anxiety Behavioral Scale, between subjects of lower general-anxiety and subjects of higher general-anxiety undergoing desensitization measured by Cattell's Anxiety Scale Questionnaire.

CHAPTER III

METHODOLOGY

Design

All first-year students registering in the Faculty of Education for the 1973 winter session at the University of Alberta, were requested to participate in this study. The initial pre-testing of general-anxiety and test-anxiety was conducted using the IPAT Anxiety Scale Questionnaire (Cattell & Scheir, 1963) and Suinn's Test Anxiety Behavioral Scale (Suinn, 1969b). While a letter accompanied the testing material indicated the voluntary nature of the procedure, it was hoped that data would be collected on the total population.

The target sample consisted of students who scored above the mean on the Test Anxiety Behavioral Scale (TABS). Following the analysis of data from the pre-test, those students scoring above the mean on the TABS were randomly assigned to one of the two treatment groups and then invited by letter to volunteer for a treatment designed to lower their test-anxiety.

The treatment sample consisted of those students from the target sample who subsequently arranged for and completed one of the two desensitization procedures or completed the follow-up questionnaire. One treatment group received desensitization using a standard hierarchy (SH) ordered in the usual low-to-high order, while the second treatment group received desensitization utilizing a modified hierarchy (MH) described as follows. In the modified hierarchy the fear items were arranged in a high-to-low order <u>within each treatment session</u> but in relation to the overall treatment program the low-to-high order between each treatment session was maintained. A control group

consisted of students from the target sample who did not volunteer for a desensitization treatment but who subsequently agreed to complete the follow-up tests. These individuals were considered a "no-treatment pseudo-control" group (PC).

Instruments

IPAT Anxiety Scale Questionnaire (ASQ).

Cattell and Scheier (1956, 1957) derived sixteen personality traits through factor analysis of an item bank of all known personality questions. Five of these sixteen personality dimensions tend to cluster together, and the manifest content of these items is suggestive of anxiety symptoms (Cattell & Scheir, 1956). This clustering together has been confirmed in over twelve studies involving more than 3,000 persons. The composite score yielded seems to be related to clinical assessments of anxiety (Cattell & Scheier, 1961; Levitt & Persky, 1962).

The ASQ (Appendix A) consists of forty items which yield two subscales, one subscale score giving a measure of overt, symptomatic, conscious anxiety and the second purported to give a more covert, unconscious measure of anxiety (Cattell & Scheier, 1963). In addition, five underlying, first-order factor scores can be derived and are labelled as: (1) Lack of Self-Sentiment (Q3); (2) Ego Weakness (C); (3) Suspiciousness (L): (4) Guilt Proneness (O); and (5) Frustration Tension (Q4).

Other measures of anxiety (Psychological, physiological, and behavioral) have been found to correlate with the ASQ (Cattell, 1963). Cattell reports correlations in the order of .30 to .40 with clinical assessments of anxiety, which he considers high when the low inter-

rater reliability of clinicians is recognized. Cattell and Rickles (1961) report that ASQ scores clearly distinguish between normals and high-anxiety neurotics. Additional studies show correlations with personality measures (Kahn, Wolffe, Quin and Sneek, 1964), with tests measuring neurotic trends (Scheier, 1964) and with other tests measuring anxiety (Scheier, 1967).

One-week test-retest reliability coefficients range from .80 to .92, while two-year test-retest reliability coefficients range from .47 to .71. For the covert scale, split-half reliability coefficients range from .60 to .63. The short interval test-retest reliabilities have been found to be .82 and .89 on the subscale scores. The first-order factor reliabilities reported have tended to be somewhat lower, but are judged to be sufficiently high for research purposes (Cattell & Scheier, 1963).

The ASQ was designed primarily to measure free-floating, manifest anxiety; high scores have been considered as potentially psychologically morbid, and are almost certainly an indication of social-emotional maladjustment (Cattell & Scheier, 1963). The first-order factors give some insight into the psychological composition of anxiety and can be utilized for research purposes.

Suinn's Test Anxiety Behavioral Scale (TABS).

The TABS (Appendix A) was used to measure pre-, post-, and follow-up (four months following treatment) test-anxiety. This instrument is a 50-item scale comprised of behavioral situations "which may arouse different levels of test-anxiety in clients" (Suinn, 1969a, p.336). A wide sampling of different types of behavior and situations are included in the scale to permit its application

to a large variety of clients. A total test score is calculated by simply assigning a score of 1 to 5 corresponding to the level of anxiety checked (with a 1 assigned to "not at all anxious" and a 5 reflecting "very much anxious"). High scores reflect high levels of test-taking anxiety.

Normative data (Suinn, 1969b) are available, and the scale has been utilized in recent research studies (Hall, 1970; Richardson, 1972; Suinn, 1968; Wisocki, 1971). The TABS correlates positively with the number of errors on examinations ($r = +.24$, $p < .05$, $n = 75$), and correlates negatively with final course grades ($r = -.26$, $p < .05$, $n = 75$; $r = -.28$, $p < .02$, $n = 158$). In two separate studies, Suinn (1969a, 1969b) also reports that the TABS correlated ($r = .59$, $p < .001$; $r = .60$, $p < .001$) with Sarason's Test Anxiety Questionnaire. Test-retest reliabilities of .74 to .80 have also been reported.

Procedure

During registration, all first-year Education students were requested to complete Cattell and Scheier's Anxiety Scale Questionnaire (ASQ) and Suinn's TABS. Subsequently, during the month of November, 1973, those 274 students scoring above the mean on Suinn's Test Anxiety Behavioral Scale (the target sample) were randomly assigned to one of two treatment groups; a standard hierarchy group (SH) or a modified hierarchy group (MH). These individuals were then informed by letter that they were above the mean on measured test-anxiety and requested to volunteer for a systematic desensitization procedure. Sixty-one subjects volunteered for treatment and sixty-five subjects volunteered for follow-up testing but not treatment;

and together these subjects constituted the Treatment Sample.

The initial pre-tested data included questionnaires completed by 584 full-time students from a possible 608. The responses of these students represented 96.7 percent of the total full-time first-year Education students. Twenty-four older mature students were eliminated from the sample pool, leaving 161 males and 399 females whose average age was 17 years and 3 months. Table 1 presents the mean and standard

TABLE 1

MEANS AND STANDARD DEVIATIONS
FOUND AMONG THE MALE AND FEMALE SUBJECTS ON THE TABS AND ASQ
WITHIN THE TOTAL(n=560), TARGET(n=230), AND TREATMENT(n=126) SAMPLES

SAMPLE	INSTRUMENT	SCALE	MALES		FEMALES	
			MEAN	SD	MEAN	SD
Total	TABS	Total	75.07	36.53	83.93	37.07
	ASQ	Covert	15.09	6.22	14.93	6.11
		Overt	16.02	6.58	16.85	6.69
		Total	31.11	11.57	31.79	11.46
Target	TABS	Total	110.41	22.08	111.53	25.51
	ASQ	Covert	17.01	5.96	16.45	6.06
		Overt	18.46	6.43	19.01	6.14
		Total	35.48	10.93	35.47	10.82
Treatment	TABS	Total	114.67	22.83	109.29	23.10
	ASQ	Covert	18.42	5.65	16.27	5.84
		Overt	20.64	5.66	18.25	6.24
		Total	39.06	9.67	34.53	11.01

deviations for both male and female subjects on the pre-test measures of test-anxiety, Covert general-anxiety, Overt general-anxiety, and total general-anxiety within the Total Sample, Target Sample and Treatment Sample. Analysis of variance procedures to investigate possible sex differences within the sample revealed no significant differences.

Factor Analysis of Suinn's Test Anxiety Behavioral Scale (TABS)

The previous studies referred to in Chapter II have indicated that test-anxiety, like general anxiety, is not a unitary concept. Therefore, scores on Suinn's TABS were subjected to factor analyses to examine the test for the presence of distinct factors such as "worry" and "emotionality" which might interact with the treatments of the present study. Additionally, it was felt that the correlates of these factors found within Cattell's ASQ might provide descriptive data by which the test-anxiety factors could be better understood. Hence Suinn's TABS was factor analyzed and the resulting cluster of test-anxiety items in the TABS (Appendix B) were formed into sub-scales for use in the analysis. These subscale scores were then examined for their correlations with the various scales of Cattell's ASQ. To explicate the reading of this study, the following table (Table 2) explains the scale abbreviations which were used.

The first factor analysis of the pre-test TABS scores for the Total Sample indicated the presence of ten factors with eigen values greater than one. Factor I, quite large, was clearly situational in nature and identifiable with the "emotionality" component found in the factor-analytic studies previously mentioned. Factor II was identified as an anticipatory "worry" class of responses, also previously described. Factors III and IV, had eigen values quite close in size to Factor II and were labelled "peer evaluation" anxiety and "authority-figure evaluation" anxiety. The eigen values of the remaining six factors were in the range of 1.0 to 2.0 and resisted precise interpretation. Since the third and fourth factors appear meaningful in both size and meaning, a four-factor solution rather than a two-factor

TABLE 2

SCALE ABBREVIATIONS

Cattell's Anxiety Scale Questionnaire (ASQ)	
Q3	Lack of Self-Sentiment, Defective Integration
C	Ego Weakness, Lack of Ego Strength
L	Suspiciousness, Paranoid Insecurity
O	Guilt Proneness
Q4	Frustration Tension, Id Pressure
A	Covert Anxiety
B	Overt Anxiety
A + B	Total General Anxiety
Suinn's Test Anxiety Behavioral Scale (TABS)	
TTA	Total Test Anxiety
STA	Situational Test Anxiety
ACA	Anticipated Consequences Anxiety
PEA	Peer Evaluation Anxiety
AEA	Authority Figure Evaluation Anxiety
Treatment Groups	
SH	Standard Hierarchy
MH	Modified Hierarchy
PC	Pseudo Control

solution was finally decided upon.

The four-factor solution (Appendix B) again yielded the factors identified as "Situational test-anxiety," "Anticipating consequences anxiety," "Peer evaluation anxiety" and "Authority-figure evaluation anxiety." The subjects' pre-tested TABS scores were then rescored to form four subscales by grouping the items which clearly loaded on one of the four factors (Appendix B). Subsequently, the total TABS score and four subscale scores of the TABS were correlated with the following subscale scores of Cattell's ASQ (Appendix C): lack of self-sentiment (Q3); ego-weakness (C); suspiciousness (L);

guilt-proneness (O); frustration tension (Q4); covert anxiety (A); overt anxiety (B); and total general anxiety (A + B).

The Desensitization Treatments

All treatment subjects attended nine 45-minute group desensitization sessions. The procedures of each session were standardized as much as possible, with the exception of the ordering of the hierarchy items in session two. Therapist variables such as prestige, personality and physical attributes were controlled by using the same therapist (the investigator) for all treatment sessions.

During the first 20 minutes of session one, a brief description of Wolpe's desensitization procedure (Appendix D) was outlined (Payne, 1972). An audio-taped training exercise in deep muscle relaxation (Appendix E) followed the treatment introduction.

Session two began with a repetition of the relaxation exercise; followed by the presentation of a demonstration fear item to illustrate the procedure. The last 20 minutes of this session involved individualized ordering of a standard pool of test-anxiety fear items (Appendix F). The subjects were then instructed to order the hierarchy items, sorting them by Q-sort technique, from the item eliciting the least amount of anxiety to that eliciting the most. At the end of this procedure, the MH group was instructed to re-order the 21-item hierarchy in the following fashion:

> You now have ordered your hierarchy with the situation eliciting the least amount of anxiety first and the situation eliciting the most anxiety last (pause). Now, beginning with the top card, number them in the following manner. On the top card, the item eliciting the least amount of anxiety, write the number three (pause). On the next card write the number two (pause). On the third card write the number one (pause). On the fourth card write the number six, and on the next card the number

> five, on the next card, the number four (pause). Are there any questions? (pause) . . . (The re-ordering continued until finally) . . . on the last card write the number nineteen (pause). Now re-order your cards, beginning with the card that has the number one written on it and ending with the card which has been numbered twenty-one.

The hierarchy for each member of the modified hierarchy group was now arranged in the following sequence: 3-2-1, 6-5-4, 9-8-7, 12-11-10, 15-14-13, 18-17-16, 21-20-19. The hierarchical order of items for the standard hierarchy group was: 1-2-3, 4-5-6, 7-8-9, 10-11-12, 13-14-15, 16-17-18, 19-20-21.

Session three began once again with the immediate presentation of the relaxation exercises, followed immediately by the desensitization procedure. In the SH group, items 1, 2, and 3 were presented in that order. In the MH group these items were presented as re-ordered; they were in the reversed order. At the conclusion of the desensitization procedure in this session, the subjects were requested to imagine the most feared item (item 21), and then to relax once more by following these instructions:

> Now I want you to become as fully relaxed as possible. To to this, count each breath you take, counting them backwards from fifty-to-one. By counting each breath you take, counting backwards from fifty-to-one, you will find that you are able to become more relaxed every time you exhale. Counting each breath will give you an easy, rather meaningless mental exercise to focus your attention on. You will find that you can do this almost effortlessly and the counting will become almost automatic. If you discover that you have lost count, that is fine, just begin from where you think you lost count and continue. Continue to become more relaxed every time you exhale. When you have reached the count of one, continue to enjoy the feelings of deep relaxation until you feel like opening your eyes. Then open your eyes and leave when you are ready, feeling refreshed, wide awake and alert.

Session four through nine began with the muscle relaxation exercises, followed by the exhaling method of relaxation. The same

procedure for desensitization was utilized for each of three new hierarchy items, presented at each session. The last session (session nine) was concluded by the administration of the post-testing of the TABS, with the request to participate in the follow-up data collection to be conducted later in the year. After a four-month waiting period, the subjects in the two treatment groups and the control group were requested to again complete the TABS.

Analysis

To test the hypotheses the data was analyzed by employing two-way treatment by level ANCOVA designs. The traditional method employed to analyze change scores has utilized test-retest difference scores. However, Cronbach and Furby (1970) have recently suggested that ANCOVA designs are a more appropriate method of analyzing change scores, as these designs avoid the scaling problems inherent in the use of difference scores. These ANCOVA designs utilize the pre-tested criterion measure as a baseline acting as covariate, while re-test scores are used as the actual criterion measure. Hence the variance due to the distribution of the subjects on the pretest measure is statistically partialled out.

At post-testing the treatment by level ANCOVA's included two treatments (the Modified and Standard Hierarchy groups) and two levels of general anxiety (high and low). In both post- and follow-up analyses, three scores (Covert, Overt and Total) of Cattell's Anxiety Scale Questionnaire were successively utilized to classify subjects as high- or low-general anxiety subjects. Similarly, the four subscale scores formed on the basis of the factor analysis of Suinn's TABS and the Total score of the TABS were utilized in separate ANCOVAs.

Thus there were fifteen separate ANCOVA analyses at both post- and follow-up testing. At post-testing, the pre-tested TABS scores were utilized as the covariate and the post-test TABS as the criterion. At follow-up testing, the pre-tested TABS scores again acted as the covariate while the follow-up TABS scores acted as the criterion measure. At follow-up analyses, the pseudo-control group data was available and thereby permitted comparison of the Modified (MH) and Standard (SH) treatment subjects to non-motivated no-treatment subjects. Eight subjects in each of the desensitization groups were unavailable for the follow-up analysis.

CHAPTER IV

RESULTS

The major hypothesis of the present study proposed that no significant differences would be found between systematic desensitization utilizing a reversed hierarchy presentation of fear-items, and desensitization employing the standard low-to-high presentation of the anxiety producing items. The second hypothesis proposed that no significant differences in test-anxiety reduction would be observed between high-and low- general-anxiety treatment subjects.

Analyses of covariance, followed by a posteriori Scheffe's were applied to the post-test and follow-up data to observe the significance of the treatment (hypothesis 1) and subject (hypothesis 2) effects. Treatment by subject (2 x 2) ANCOVA's were utilized at post-test time. At follow-up testing the pseudo-control group data was added and 3 x 2 ANCOVA's were employed, allowing for treatment-control group comparisons.

Scores of test-anxiety as measured by the Test Anxiety Behavioral Scale (TABS) were utilized as covariate and criterion measures. It will be recalled that the TABS yielded four distinct types of test-anxiety measures: Situational test-anxiety (STA), Anticipating consequences anxiety (ACA), Peer evaluation anxiety (PEA), Authority-figure evaluation anxiety (AEA), plus a Total test-anxiety score (STA + ACA + PEA + AEA). Separate analysis of covariance were conducted utilizing each of these scores of test-anxiety. In each analyses the pre-test score acted as the covariate while the corresponding post-test score acted as the criterion measure. In the follow-up analysis

the pre-test score again acted as the covariate while the follow-up score was utilized as the criterion measure.

In addition, for each test-anxiety score, a separate analysis was conducted for each of the three general-anxiety scores obtained from the pre-test IPAT Anxiety Scale Questionnaire. Subjects were designated as having high- or low- general anxiety on the basis of their Covert-anxiety score (A), their Overt-anxiety score (B) and their total general-anxiety score (A + B). Each test-anxiety scale was then analyzed using each of these three anxiety scores to classify subjects as high or low in general-anxiety. Hence, at post-testing, fifteen analysis of covariance were conducted to test the hypotheses (Appendix G).

Prior to these treatments by subject analyses, ANOVA procedures were employed to test for differences between the treatment group means (Table 3) on the pre-tested measures of general- and test-anxiety. The ANOVA's revealed no significant initial differences among the treatment groups in Total test-anxiety (TTA), Situational test-anxiety (STA), Anticipating Consequences test-anxiety (ACA), Peer evaluation test-anxiety (PEA), Authority-figure evaluation anxiety (AEA), Total general-anxiety (A + B), Covert (A) or Overt (B) general-anxiety.

TABLE 3

COMPARISON OF MEANS ON THE PRE-TEST MEASURES OF TEST ANXIETY AND GENERAL ANXIETY BETWEEN MODIFIED (MH), STANDARD (SH), AND CONTROL (PC) TREATMENT GROUPS

	SCALE	GROUP	n	$\bar{X}$	SD
	Test Anxiety Behavioral Scale				
(TTA)	Total Test Anxiety	MH	25	158.64	21.84
		SH	35	153.29	22.48
		PC	65	158.18	24.31
(STA)	Situational Test Anxiety	MH	25	51.68	6.44
		SH	35	51.32	6.44
		PC	65	51.43	5.41
(ACA)	Anticipating Consequences Anxiety	MH	25	47.56	9.15
		SH	35	44.09	10.65
		PC	65	49.89	10.26
(PEA)	Peer Evaluation Anxiety	MH	25	37.04	5.28
		SH	35	33.94	5.28
		PC	65	33.39	7.68
(AEA)	Authority Figure Evaluation	MH	25	22.36	5.38
		SH	35	23.94	5.39
		PC	65	23.47	6.28
	Anxiety Scale Questionnaire				
(A+B)	Total General Anxiety	MH	25	38.16	9.82
		SH	35	35.26	11.79
		PC	68	35.02	10.83
(A)	Covert General Anxiety	MH	25	18.16	5.53
		SH	35	16.89	6.26
		PC	68	16.31	5.83
(B)	Overt General Anxiety	MH	25	20.00	5.83
		SH	35	18.37	6.47
		PC	68	18.71	6.25

Hypothesis I: Treatment Effects

The Total test-anxiety (TTA) means derived from pre- and post-administrations for the low- and high-Total general-anxiety subjects in each treatment appear in Table 4.

TABLE 4

COMPARISON OF MEANS ON PRE- AND POST- ADMINISTERED TOTAL TEST-ANXIETY, FOR THE MODIFIED AND STANDARD HIERARCHY TREATMENT GROUPS, BY HIGH- AND LOW- GENERAL ANXIETY

Administration	Test Anxiety Scale	Treatment Group	Total General-Anxiety Low	n	High	n
Pre-Test	Total	Modified	104.36	11	117.86	14
		Standard	96.90	20	120.80	15
Post-Test	Total	Modified	93.18	11	68.75	14
		Standard	61.35	20	61.35	15

TABLE 5

SUMMARY OF ANCOVA DIFFERENCES ON PRE- AND POST- ADMINISTERED TOTAL TEST-ANXIETY SCORES (TTA), FOUND AMONG THE MODIFIED AND STANDARD HIERARCHY TREATMENTS AND TOTAL GENERAL-ANXIETY (ASQ: A+B)

Source of Variation	SS	df	MS	F	p
Treatment	2,337.75	1	2,337.75	3.37	0.07
General-Anxiety	4,028.73	1	4,028.73	5.81	0.02
Treatment x Anxiety	308.71	1	308.71	0.45	0.51
Covariate	7,715.75	1	7,715.75	11.13	0.002
Errors	38,113.00	55	692.96		

Analysis of covariance (Table 5) revealed appreciable disparity between treatment means, although the criterion level of .05 was not

reached. Subsequent analysis, using Scheffe Multiple Comparisons revealed that the application of the Standard Hierarchy (SH) treatment produced greater but non-significant test-anxiety reduction than the Modified (MH) treatment.

To illustrate treatment effects, Table 6 represents the means of each test-anxiety scale at pre-, post-, and follow-up testing. Table 7 is a summarization of the F-ratios found in each ANCOVA for each of test anxiety scales. At post-analysis, fifteen separate Treatment X Level of General Anxiety (2 X 2) ANCOVA's were conducted between the Standard (SH) and the Modified (MH) treatments, utilizing three scores of the ASQ to categorize general-anxiety subjects as either low or high. At follow-up analyses, the fifteen treatment F-ratios represent differences between the Standard (SH), Modified (MH) and Pseudo-control (PC) groups.

Significant differences (Table 7) between the Modified and Standard Hierarchy treatments were found at post-analysis:

(1) When the Anticipating Consequences Test-Anxiety (ACA) scale was the criterion measure, when the Total, Covert and Overt ASQ scales were used to categorize low and high general-anxiety subjects respectively; and

(2) When the Authority-figure Evaluation Test-Anxiety (AEA) scale was the criterion measure, when the Total, Covert and Overt ASQ scales were used to categorize low and high general-anxiety subjects respectively.

Although a criterion level of .05 was not reached, the Standard (SH) Hierarchy treatment produced greater test-anxiety reduction than the Modified Hierarchy (MH) treatment:

(1) for the Total Text-Anxiety (TTA) scale, when utilizing the Total, Covert and Overt general-anxiety scales; and

(2) for the Situational Test-Anxiety (STA) scale, when utilizing the Total, Covert and Overt general-anxiety scales.

No significant differences were noted between the Modified and Standard Hierarchy treatments in reducing Peer Evaluation Test-Anxiety (PEA) at post-analysis.

In summary, whenever significant differences were found between the Modified and Standard treatments in the post-analysis, the Standard Hierarchy treatment produced superior test-anxiety reduction. In addition, whenever interaction F-ratios obtained significance, the high general-anxiety participants in the Standard Hierarchy (SH) treatment demonstrated superior fear reduction.

In follow-up analyses, which allow for comparisons between the Modified, Standard and no-treatment Pseudo-control groups, Scheffe comparisons revealed that no significant differences in test-anxiety reduction existed between the Modified and Standard Hierarchy treatment groups. All of the significant treatment F-ratios were found to be attributable to the discrepancy between the desensitization treatment subjects and the control-group subjects.

When the interaction F-ratios approached or reached significance, inspection of the means (Appendix G, Tables 42, 44 and 50) revealed that the effect was attributable to discrepancies between the high- and low- Covert anxious subjects who were subjected to the Modified (MH) treatment. High-Covert general-anxiety subjects exposed to the Modified (MH) treatment demonstrated superior test-anxiety reduction

at follow-up analysis.

Hypothesis II: Subject Effect

At post-testing, main effects due to both Total and Overt general-anxiety were noted in the analysis when the Total Test Anxiety (TTA), Anticipating Consequences Anxiety (ACA), and Peer Evaluation Anxiety (PEA) test-anxiety scales were the criterion measures. In each case subjects who were characterized as possessing high Total or high-Overt general-anxiety demonstrated more test-anxiety reduction than subjects of low Total or low-Overt general-anxiety. Similarly, subjects possessing high-Overt general-anxiety demonstrated a greater reduction in Authority-figure Evaluation, and a trend was evident for high-Overt general-anxiety subjects to show a greater reduction in Situational test-anxiety. Further, when treatment by general-anxiety interactions in the post analyses obtained or approached significance (Tables 12, 16, 20, 30; Appendix G) the high general-anxiety subjects exposed to the Standard Hierarchy treatment demonstrated the most Test-anxiety reduction.

In the follow-up analysis, main effects due to Covert general-anxiety were noted, when the Total Test Anxiety (TTA), Peer Evaluation Anxiety (PEA) and Authority-figure Evaluation Anxiety (AEA) test-anxiety scales were the criterion measures. In each case subjects who were characterized as possessing high-Covert general-anxiety demonstrated a greater reduction in test-anxiety than those subjects of low-Covert general-anxiety. Similarly, the high-Covert general-anxiety subjects showed more but non-significant Anticipating Consequences Anxiety (ACA) reduction than low-Covert general-anxiety subjects. Further, when Treatment X General-anxiety interactions obtained or approached

significance, the high general-anxiety subjects exposed to the Modified Hierarchy treatment demonstrated the most test-anxiety reduction, while the low general anxiety subjects exposed to the Modified Hierarchy treatment demonstrated the least amount of test-anxiety reduction.

Additional Findings

The Total score (TTA) of the Test Anxiety Behavioral Scale (TABS) and the four subscales derived from the factor-analysis were correlated with the Covert (A), Overt (B), and Total (A+B) scores and five primary subscale scores of the Anxiety Scale Questionnaire (ASQ).

The magnitude of the correlations found between the test-anxiety and general-anxiety scales for the Total Sample (Appendix C, Table 1) are within the low-moderate range, those of the Target Sample (Appendix C, Table 2) and Treatment Sample (Appendix C, Table 3), even though significant, are so low that they must be viewed with considerable caution. Given the large size of the samples and the confounding factor of volunteerism within the Treatment sample, the correlational data can only be viewed as suggestive.

Within the Total Sample all the test-anxiety scales were positively correlated:

(1) to the Covert general-anxiety measure (A) ranging in magnitude from $\underline{r}$ = .23 to $\underline{r}$ = .32;

(2) to the Overt general-anxiety scale (B) ranging in magnitude from $\underline{r}$ = .32 to $\underline{r}$ = .40; and

(3) to the Total general-anxiety scale (A=B) ranging in magnitude from $\underline{r}$ = .30 to $\underline{r}$ = .40.

Within the Treatment sample the correlations between the test-

TABLE 6

SUMMARY TABLE OF THE MEANS OF EACH TEST-ANXIETY SCALE FOUND IN THE MODIFIED, STANDARD, AND CONTROL GROUPS[a] AT PRE-, POST-, AND FOLLOW-UP TIMES

		Test Anxiety Scale				
		TTA	STA	ACA	PEA	AEA
Group	n	Pre-Test Scores				
(MH) Modified Hierarchy	25	158.64	51.68	47.56	37.04	22.36
(SH) Standard Hierarchy	35	153.29	51.32	44.09	33.94	23.94
(PC) Pseudo-Control	65	158.18	51.43	49.89	33.39	23.47
		Post-Test Scores				
(MH) Modified Hierarchy	25	122.93	39.11	37.49	26.85	19.48
(SH) Standard Hierarchy	35	107.98	35.14	31.71	24.40	16.73
(PC) Pseudo-Control	0	-	-	-	-	-
		Follow-up Test Scores				
(MH) Modified Hierarchy	17	104.82	32.76	31.40	23.15	17.51
(SH) Standard Hierarchy	27	107.62	35.56	32.65	22.57	17.67
(PC) Pseudo-Control	65	143.22	46.86	42.95	30.30	23.11

a Pseudo-control group data not available at post-testing.

TABLE 7

SUMMARY TABLE OF THE F RATIOS, FOUND IN EACH TREATMENT[a] X LEVEL OF GENERAL ANXIETY[b] ANCOVA[c], FOR EACH TEST ANXIETY SCALE AT POST AND FOLLOW-UP TIMES

Test-Anxiety Scale	Post-Test F's			Follow-up F's		
	Treatment	Anxiety	Interaction	Treatment	Anxiety	Interaction
Total General Anxiety Score						
(TTA) Total Test Anxiety	3.37*	5.81**	0.45	19.85***	2.16	2.01
(STA) Situational Test	3.52*	1.36	0.78	23.81***	0.45	1.34
(ACA) Anticipating Consequences	6.24**	6.08**	0.73	9.02***	2.31	2.08
(PEA) Peer Evaluation	0.94	5.49**	0.43	14.15***	1.01	1.48
(AEA) Authority Evaluation	5.94**	1.44	0.81	9.01***	3.03*	0.85
Covert General Anxiety Score						
(TTA) Total Test Anxiety	2.88*	0.12	2.43*	22.82***	5.40**	3.26**
(STA) Situational Test	3.25*	1.56	1.62	26.93***	1.48	2.35*
(ACA) Anticipating Consequences	5.70**	0.55	4.29**	10.56***	3.43*	1.84
(PEA) Peer Evaluation	0.74	0.01	1.74	11.52***	8.66***	4.22**
(AEA) Authority Evaluation	6.29**	0.08	3.66*	15.94***	4.28**	2.14
Overt General Anxiety Score						
(TTA) Total Test Anxiety	3.59*	10.31***	0.00	19.05***	0.00	0.92
(STA) Situational Test	3.93**	2.72*	0.16	23.26***	0.17	0.33
(ACA) Anticipating Consequences	7.04***	6.92***	0.35	8.54***	0.10	1.03
(PEA) Peer Evaluation	1.15	8.37***	0.42	13.82***	0.02	0.82
(AEA) Authority Evaluation	7.01***	4.24**	4.03**	10.72***	0.07	1.55

a Comparisons at post-test are between the Modified and Standard Hierarchies. Comparisons at follow-up test are between the Modified, Standard Hierarchies and the Control groups.

b High- and low-general anxiety subjects identified by utilizing the Total, Covert and Overt Scale of the IPAT.

c Pre-tested test-anxiety scores utilized as the covariate in both Post- and Follow-up analyses.

* $p < .10$, ** $p < .05$, *** $p < .01$

anxiety scales and Covert-anxiety scale (A) failed to reach the .05 level of significance, while the correlations for the Overt scale (B) and the Total general-anxiety scale (A+B) ranged from r = .19 to r = .25. In addition, the Situational test-anxiety scale (emotionality) or stress component) was unrelated to Overt, Covert or Total general-anxiety. General-anxiety within the treatment volunteers appeared to be unrelated to the stress factor of test-anxiety and related only to the "worry" scales (ACA, PEA, and AEA).

Summary of Analysis

The post-analyses provided sufficient evidence to prevent the acceptance of Hypothesis I of no significant differences between the Modified (MH) and Standard (SH) treatments. The application of the Standard Hierarchy treatment produced superior test-anxiety reduction. At follow-up analysis no significant main effect was noted between the treatments. However, when utilizing the Covert general-anxiety scale to classify subjects two interactions were found to be significant (Tables 43, 51; Appendix G), indicating that the high-Covert general-anxiety subjects exposed to the Modified Hierarchy demonstrated significantly more test-anxiety reduction than the low-Covert general anxiety subjects.

Similarly, sufficient evidence was found to reject Hypothesis II (no difference between high and low general-anxiety subjects in the amount of test-anxiety reduction) in both the post- and follow-up analysis. These results also indicated that this relationship is complex, as the significant differences found were dependent upon the interaction of the particular scores employed, the time of data collection and the treatment utilized.

CHAPTER V

DISCUSSION

The primary purpose of this study was to examine the effect of changing the order of the test-anxiety items in the fear hierarchy during group desensitization. It was theorized that systematically presenting the fear items in a high-to-low order would affect fear reduction by producing the cognitive (preceptual) effects proposed by Melamed (1969). At post-testing immediately following treatment, the experimental treatment (MH) produced significantly less test-anxiety reduction than the standard treatment (SH). At follow-up testing, four months later however, no significant treatment main effects in test-anxiety reduction were observed between the experimental and standard treatment groups. Subjects presented with the experimental hierarchy treatment (MH) showed a progressive decrement in test-anxiety reduction between post- and follow-up testing while subjects presented with the standard hierarchy demonstrated little or no change in test-anxiety reduction.

The second purpose of the study was to examine the influence of general-anxiety in facilitating or impeding the reduction of test-anxiety by short term group desensitization. The results indicated that the treatment subjects' level of general anxiety did influence the outcome of desensitization. In the post-test analysis high-Total general-anxiety subjects and high-Overt general-anxiety subjects showed significantly more test-anxiety reduction than did low-general anxiety subjects. Similarly, in the follow-up analysis, high-Covert general-anxiety subjects showed more test-anxiety reduction than low-Covert general-anxiety subjects particularly in the experimental treat-

ment. A high level of general-anxiety, as measured by these scales was associated with greater test-anxiety reduction rather than having the commonly believed deleterious effect upon desensitization.

Treatment Effects

The finding that the standard low-to-high fear item desensitization treatment produced significantly more test-anxiety reduction at post-test time than the experimental high-to-low fear-item treatment suggests that the order of the fear-items in the desensitization hierarchy is important to the treatment process; that is, the most efficacious desensitization treatment of this study was the one that proceeded from the least- to the most-aversive items. The follow-up analysis revealed however, that the ordering of the fear-items made no meaningful group differences to the eventual outcome of desensitization. Subjects undergoing the standard treatment (SH) demonstrated that their total decrement in test-anxiety took place during treatment. Subjects undergoing the experimental treatment (MH), given a four month time interval demonstrated equivalent test-anxiety reduction. In effect, they reported the same treatment outcome, but at a later time. Inclusion of the pseudo-control group data at follow-up testing permits the conclusion that both the standard (SH) and the experimental (MH) groups showed significant and meaningful reductions in test-anxiety. This finding was expected and in agreement with the findings of other investigators (Donner & Guerney, 1969; Mitchell & Ingram, 1970; Mitchell, 1971) who found group desensitization to be effective in reducing test-anxiety.

The presence of significant outcome differences between the two treatment groups at post-testing and the absence of these group

differences at follow-up testing allows for a great deal of speculation. It would seem that exposure to the experimental group (MH) treatment induced change to begin and, with time, further test-anxiety reduction occurred. Had the subjects exposed to the standard (SH) treatment continued to show a reduction in test-anxiety over time as well, we might have concluded that the treatment of desensitization per se induces change to begin and that further time is required to show complete fear reduction. But such was not the case. How, then, may these outcome differences be interpreted? It would seem that the ordering of items in the fear hierarchy may be regarded as a maneuver which affects the process of desensitization but not the outcome. The treatment findings suggest that presenting the hierarchy items in the traditional low-to-high order facilitates faster desensitization than presenting the hierarchy items in a modified high-to-low order.

The rationale for arranging the hierarchy items in a high-to-low sequence was derived from Melamed's (1969) work. Melamed proposed that a high-to-low ordering of fear items would facilitate desensitization because treatment subjects would perceive the lower-feared items as even less fearful if they were preceded by a higher-feared item (Melamed's Contrast-effect Hypothesis); as a consequence, subjects would then behave less fearfully (Valin & Ray, 1967). Without knowledge of the subjects' cognitions vis-a-vis their anxious responding to each hierarchy item, it is not possible to deduce whether Melamed's contrast effects were or were not present. Thus, the following discussion considers both alternatives.

If we assume that contrast effects were present, that is the presentation of the higher fear-item first did indeed force the

subjects in the experimental treatment to view the succeeding two lower fear-items as even less arousing, then the subjects may have been induced to think "this item is frightening." This cognition may have strengthened the fear properties of that item making it more resistant to desensitization. This speculation is in accord with Wilkins' (1971) "Informational Feedback of Success" proposal. Wilkins maintains that the desensitization participant's perception of his own behavior during desensitization is a source of relevant feedback with reinforcing properties. He suggests that the participant may experience anxiety, signal his anxiety, observe himself signalling anxiety, and regard this as subjective evidence of his failure. If the opposite reactions occur the participant would then have subjective evidence of his success. There is some empirical support for Wilkins' speculation. Wolpe (1963) and Schubot (1966) have reported that the frequency of anxiety signalling is inversely related to anxiety reduction. Hence, if Wilkins is correct, participants in the experimental treatment began each desensitization session observing themselves signalling increased anxiety and experienced failure.

If we continue to assume that Melamed's contrast effects were present, a second argument might be that the subjects in the experimental treatment were induced to think "this item is more frightening than I thought." In this event, Hake's (1957) Subjective-standard Hypothesis may have been operative. The subject would then have been induced to believe that the higher-feared item in each session was more anxiety producing in the following manner.

The Subjective-standard Hypothesis proposes that the first-item presented is judged to be near the middle of a subjective fear-scale.

In the present study, we do not know what subjective fear-scale the participants utilized. Did they use each set of three items presented in each session as their subjective fear scale, or did they use the 1-2-3, 4-5-6, 7 . . . 18, 19-20-21, a twenty-one point scale as their reference point? If this latter scale was used as the standard of reference, then it follows that the first presented item of each treatment session in the lower half of the hierarchy was judged to be towards the 10th, 11th or 12th fear-item in intensity. Thus the fear properties of items 3, 6 and 9 would be subjectively increased. This effect would be partially counterbalanced by the participants in the experimental treatment perceiving items 15, 18 and 21 as less arousing. However, those items higher in the hierarchy are known to be more difficult to desensitize, requiring more presentations to extinguish. Hence, the artificial induction of more anxiety to items 3, 6 and 9 might account for the post-test descrepancy between the standard and experimental treatment groups.

One might postulate that the hoped for contrast effects were not present and view the treatment results within Wolpe's forward generalazation rationale for the use of a low-to-high graduated hierarchy. This would have occurred if the distance between fear-items was so small as to go unnoticed by the participants. That is, the intensity of fear aroused by the items 3, 2, and 1 may have been so similar that the subjects did not perceive a difference (i.e. 3 to 2 to 1 may have had equally arousing fear value; similarly 6 to 5 and 4; 9 to 8 and 7; and so on). If this was the case, then each set of three items may be considered a unit of fear-stimulus and the hierarchy utilized thus considered a seven unit (three items to a unit) hierarchy. The

hierarchy of the experimental treatment then could be viewed as identical to the hierarchy of the standard treatment. Wolpe (1958) in his exposition regarding the construction of the hierarchy, considers that the first item in the hierarchy should be no more than 15 SUD's (15 units out of 100 units of subjectively felt discomfort). Zero SUD's represents an absence of felt physical tension (complete muscular relaxation). Hence, if the first item of the hierarchy elicits 15 SUD's and each following fear interval is no more than the 5 SUD's apart, the resulting hierarchy would consist of no more than eighteen items. In practice, however, as discussed by other therapists who utilize systematic desensitization, and reviewing examples of hierarchies utilized by Wolpe for explanatory purposes, rarely are more than 14 or 15 item hierarchies used and often 9 or 10 fear-items constitute a hierarchy.

If we assume that all of the sets of the three items used in the hierarchy of the treatments were so close in stimulus value, as to be indistinguishable from each other, it is not difficult to imagine that the hierarchy, as subjectively perceived by at least some of the participants constituted a seven unit hierarchy. This would account for the successful outcome of the experimental treatment. However, this logic breaks down, when one considers that the standard treatment group then would have been subjected to the identical hierarchy and no significant differences should have been observed between treatments at post-test. If, however, because of the item reversal, the modified hierarchy only approximated the standard hierarchy, then the post-test findings could be understood within Wolpe's rationale.

As indicated previously, the treatment findings of this

investigation suggest that the ordering of the items in the fear hierarchy may be a maneuver which affects the process of desensitization but not the outcome. The findings mitigate against acceptance of the conclusion of Emery and Krumboltz (1967) and Bandura (1969), who have indicated that the graduated hierarchy may be unimportant to the process of desensitization. The findings of the present study suggest that further study is warranted, particularly in the light of the conflicting results reported by Krapfl (1969). Krapfl reported no significant outcome differences between standard, complete hierarchy reversal, and randomized hierarchy treatment groups at post-testing analysis after five sessions of systematic desensitization, and at follow-up analysis, six weeks later.

The outcome differences observed at post- and follow-up testing in this study serve to demonstrate the importance of utilizing designs incorporating follow-up analyses in desensitization research. This investigator chose to obtain follow-up data immediately before the participants wrote their final university examinations. The fact that the students were preparing for the same stress situation that motivated them to receive treatment argues for the face validity of the findings. However the question of the effect of history (time between observations) on the reliability of these findings remains an unanswered question and is a design limitation of this study.

The writer of the present study felt that a reasonable approach to the investigation of test-anxiety was to use a factor-analytic approach to understand and investigate whether or not unique factors were subsumed by Suinn's TABS. It was further reasoned that these subscales might relate differently to general-anxiety, the process,

and outcome of desensitization.

Investigation of these subscales revealed that there was a differential effect in fear reduction by the standard and experimental treatments on these scales at post-analysis, but not at follow-up analysis. In the post-analysis, the subscales did discriminate differences which would have gone unnoticed had the Total score of the TABS been the single measure. For this reason continued investigation of these factors seems important. No apparent reasons for these differences are in evidence from inspection of the data and considerable caution seems warranted.

General Anxiety

This study sought to explore the effect of general anxiety upon the outcome of systematic desensitization. Authorities in the field (Wolpe, 1969; Lazarus, 1965a; Glick, 1970) are of the opinion that high general anxiety impedes or entirely prevents the process and outcome of desensitization. The experience of these clinicians parallels the reports of Eysenck and Rachman (1965), Lang and Lazovick (1963), and the empirical work of Lang (1964) which demonstrated the presence of a negative correlation between subjects' pretested general-anxiety and the amount of reduction of a phobic response. Theoretical support for the view that general-anxiety inhibits fear reduction also exists if one adopts the view that systematic desensitization is a process that can be conceptualized as a complex learning task. Spence and his associates (1958) theorize that high general-anxiety interferes with the learning of a complex task but facilitates the learning of a simple task. They postulate that the strength of a learned

response is dependent upon the interaction of a learning factor (task complexity) and a motivational construct (drive) of which anxiety is a component. According to their theory, a high level of anxiety provides the necessary motivation to learn simple tasks; while the same high level of anxiety provides extraneous cues which interfere with the concentration necessary in dealing with a complex task.

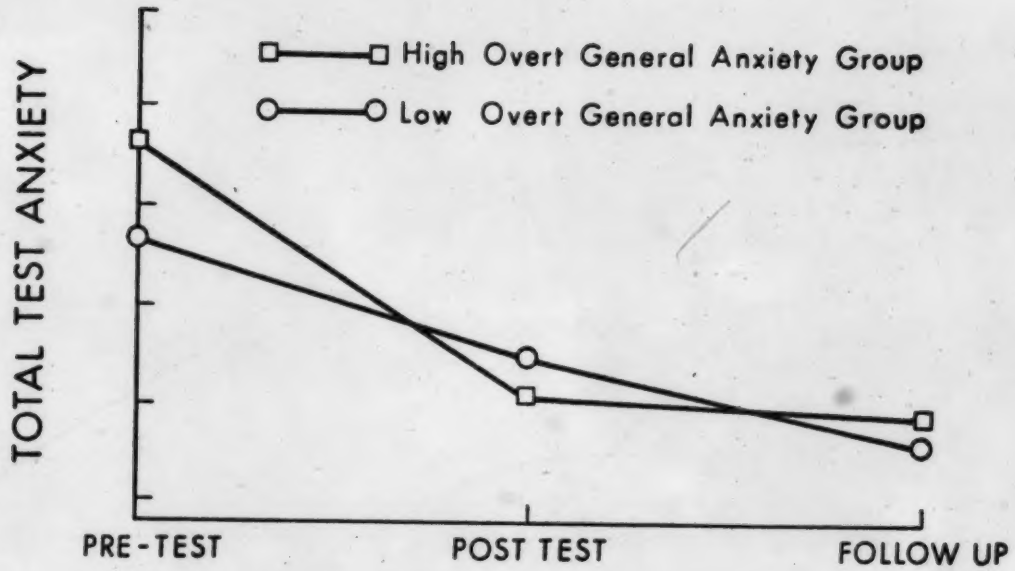
The analyses revealed that among the treatment subjects there were significant differences between the high- and low-general-anxiety subjects in reported test-anxiety reduction from pre- to post-testing and from pre- to follow-up testing. High general-anxiety subjects reported significantly more fear reduction than low general anxiety subjects. These findings do not support the commonly held opinion that high general-anxiety impedes or entirely prevents the desensitization process. Similarly, the findings oppose the results reported by Eysenck and Rachman (1965), Lang and Lazovick (1963) and Lang (1964). The findings do, however, suggest that systematic desensitization may well be a simple learning task (one in which the correct response is foremost in the hierarchy).

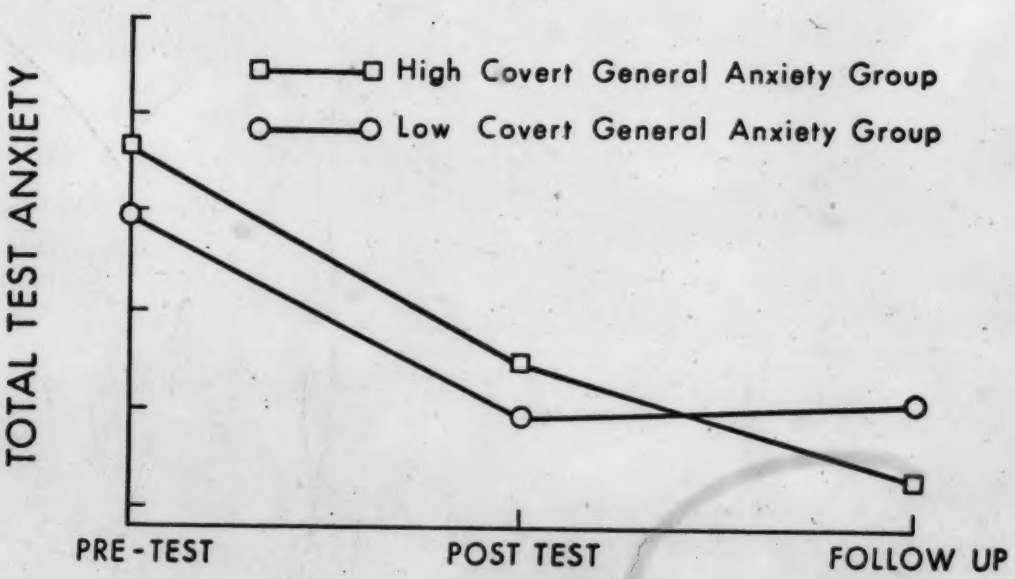
Although the analyses revealed that high general-anxiety subjects reported significantly more fear reduction, the data also indicate that the relationship is not a simple one. The significant main effects due to high general-anxiety seemed to be dependent upon the following two conditions: (1) whether the Overt, Covert or Total (Overt + Covert) ASQ scores were utilized as measures of general-anxiety; and (2) the time of data collection. At post-testing, immediately following treatment, the main effect due to high general-anxiety was seen to be attributable to high-Overt general-anxiety (Figure 1), while at follow-

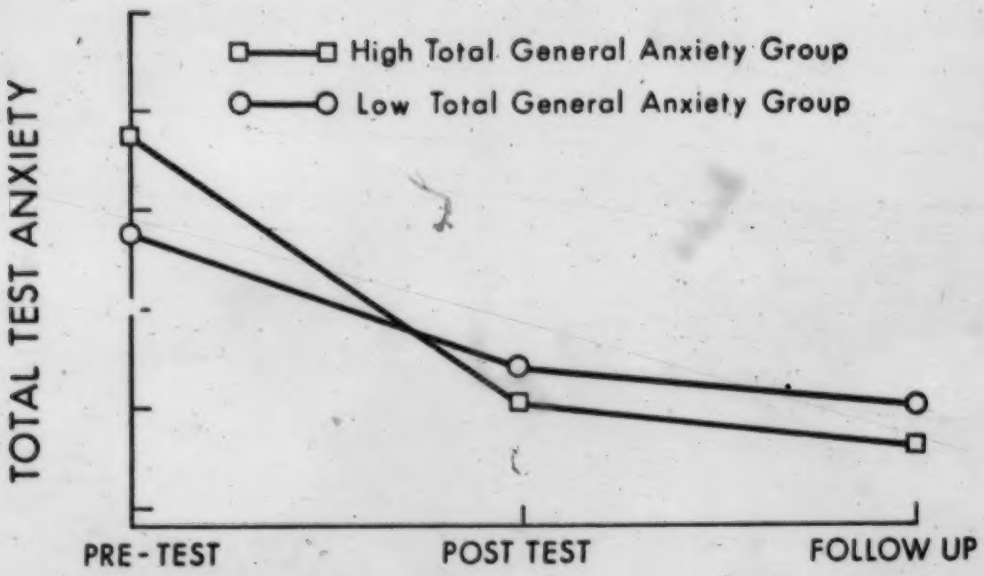
up testing the main effect due to high general-anxiety was seen to be attributable to high Covert general-anxiety (Figure 2). When the total score of the ASQ was utilized in the analyses as the measure of general-anxiety, it was found that high-Total general-anxiety subjects showed significantly more test-anxiety reduction at post-testing but not at follow-up (Figure 3). How can these complex results be explained?

Cattell and Scheier (1963) have stated that the Overt and Covert scales of the ASQ reflect the conscious and unconscious components of general-anxiety. Using Cattell's differentiation, it could be hypothesized that subjects high in unconsious (covert) general-anxiety might be unaware of changes in self-reported test-anxiety immediately after the completion of a brief treatment. These unaware individuals might require a longer period of time or an actual examination experience to gain awareness of their reduced test-anxiety. It is difficult to maintain this line of thought, however, when the data indicates that subjects high in both conscious (Overt) and unconscious (Covert) general-anxiety did not continue to show superior fear reduction at follow-up testing. How is it that the effect due to Overt (conscious) general-anxiety is not preserved at follow-up testing? How is it that the effect due to Covert (unconscious) general-anxiety is not evident at post-testing? What is the meaning of the differences between individuals who can be characterized as being: (1) high in both Overt and Covert general-anxiety; (2) low in both Covert and Overt general-anxiety; (3) low in Overt general-anxiety and high in Covert general-anxiety; and (4) low in Covert general-anxiety and high in Overt general-anxiety? The total general-anxiety scores

utilized in the analyses were those obtained from subjects characterized above as types (1) and (2). No significant differences in test-anxiety reduction were found at follow-up using these combined Overt and Covert scores (see Figure 3). This finding indicates that the effects of Overt and Covert anxiety are not additive with respect to test-anxiety reduction in desensitization. The finding also allows the speculation that the Overt and Covert general-anxiety scores are measuring different phenomenon, as well as general-anxiety, and these phenomenon may account for the observed, but un-explained behavioral consequences. Three such phenomenon may be "authoritarianism," "social-desirability," and "neuroticism."


High Overt General Anxiety Group
Low Overt General Anxiety Group
TOTAL TEST ANXIETY
PRE-TEST
POST TEST
FOLLOW UP


High Covert General Anxiety Group
Low Covert General Anxiety Group
TOTAL TEST ANXIETY
PRE-TEST
POST TEST
FOLLOW UP


High Total General Anxiety Group
Low Total General Anxiety Group
TOTAL TEST ANXIETY
PRE-TEST
POST TEST
FOLLOW UP

Little research has focused upon the behavioral correlates of the Overt and Covert scales of the ASQ. However, Bendig and Hountras (1959) have reported that the Overt scale correlated positively with the F-scale of authoritarianism, while the Covert scale did not. Similarly, Bendig (1959) found that the Overt scale had a significantly higher correlation than the Covert scale with the tendency to make socially desirable responses. Considering that the setting for the brief group desensitization of this study was highly structured and assuming the presence of a competent therapist, it would have been almost certain that the therapist was viewed as an authority-figure. Similarly, the self-report measure of test-anxiety utilized in this study would be vulnerable to the biasing effects of social-desirability. Taken together, it seems plausible that these personality variables might account for the tendency of high-Overt general-anxiety subjects to show a greater decrement of test-anxiety at post-testing while under the watchful eye of the therapist.

Mitchell (1971) reported results indicating that "neuroticism" may be one other such personality variable accounting for differential fear change in desensitization. Mitchell and Igram (1970), utilizing the Total score of the ASQ, obtained results similar to those of this study. They proposed that the tendency of high Total general-anxiety (ASQ) subjects to show more reduction at post-test time and the subsequent disappearance at follow-up testing suggested the presence of a neurotic component. Mitchell (1971), investigating this possibility, found that subjects of high Total general-anxiety and high-neuroticism, as measured by the Neuroticism Scale of Eysenck's Personality Inventory, demonstrated significant differences on the "speed" of desensitization

to a test-anxiety hierarchy. However, Mitchell did not find a significant effect on the amount of fear reduction. The results of this study do, however, show differences in amount of fear reduction. The extent to which neuroticism exists as a superstructure over the anxiety component has not been adequately investigated. The ASQ has been reported (Cattell & Scheier, 1963) to have a moderately high correlation with neuroticism when the upper quartile scores are considered. There is some evidence within the correlation mattices for the treatment sample of this study (Appendix C) to suggest that the Overt scale of the ASQ may be related to the neurotic (worry) components of test-anxiety.

The correlations found with the treatment sample between the Covert general-anxiety scale (A) and the test-anxiety scales failed to reach significance, however, the Overt-scale (B) maintained low positive correlations. Mitchell's (1971) proposal that high-neuroticism may be a relevant variable effecting subjects' resonsivity to desensitization deserves further attention. The correlated data of this study suggests that this neurotic component may be related to the Overt scale of the ASQ.

The low correlations between the test-anxiety and general-anxiety scales in the Treatment Sample was of considerable surprise to the writer. While one might expect an erosion of the correlations from the choosing of subjects from the upper half of the distribution on test-anxiety, the writer did not expect the complete disappearance of so many correlations. Hedl's (1972) report of a positive relationship between A-Trait general-anxiety and test-anxiety was not supported by the findings of the present study. These findings lend support to the contentions of Sarason (1967) and Cattell (1965) who maintain

that general-anxiety measures and specific A-state measures are relatively independent constructs.

Limitations: Internal and External Validity

The design limitations of this study may be viewed from two perspectives: (1) short-comings which affected the study findings in this experimental instance (internal validity); and (2) short-comings which affected generalizing beyond the study sample (external validity). The following discussion will focus on each of these perspectives in turn.

The internal validity of the present study may have been affected by the intrasession history differences that existed between the treatment groups. The major intrasession difference between the modified and standard treatment groups occurred as a result of deciding to use a common therapist. Therefore, treatment sessions were held at different times. In addition, the pseudo-control subjects, in contrast to the treatment subjects, were not randomly assigned and were not post-tested. The following graphic presentation illustrates these intrasession differences.

Group	Pre-test	Assign-ment	Appeal	Treatment	Post-	Follow-up
MH	01	R	X1	X2	02	03
SH	01	R	X1	X3	02	03
PC	01		X1			03

X1 represents the investigators appeal to the Target Sample to participate in the treatment. X2 refers to the Modified Treatment; X3 refers to the Standard Treatment; 01, 02, and 03 refer to pre-, post-, and follow-up testing; and R indicates random assignment to separate treatment groups. The left-to-right dimension indicates the temporal order and the X's and O's vertical to one another occurred at

similar times.

When excluding the control group from the above design, it can be seen that the internal validity was preserved for comparisons between the modified and standard treatment groups with the exception of time of treatment. The participants in both groups shared the same: maturational events; pre-test sensitization; regression due to extreme scores; instrumentation; and the same selection-maturation interaction. The following observations, however, are suggestive that intrasession history differences existed between the modified and standard treatment groups. Differential rates of volunteerism for the Modified (MH, $\underline{n}$ = 25) and Standard (SH, $\underline{n}$ = 35) treatments were observed. Similarly, differential mortality rates between post- and follow-up testing were also observed (MH, 32%; SH, 23%). While ANOVA's on the pre-tested TABS and ASQ scores between treatment groups revealed no significant differences, Campbell & Stanley (1963) indicate that this does not guarantee that the groups were equivalent. No tests of equivalence were conducted on those subjects who completed the treatments but who failed to respond to the follow-up questionnaire.

In a similar fashion, it can be seen that the control group subjects were different from the treatment subjects in terms of the number of administrations of the TABS. This is not seen as a serious limitation in regards to the differences found between the modified and standard treatments. It may, however, be a serious limitation in the follow-up analysis with respect to the general-anxiety findings. Suinn (1969b) has reported normative data on the TABS, which indicates that between first and second administrations of this instrument, one

should expect a 10 point decrease in scores. No normative data is available which indicates what instrument decay might be expected on further administrations. Given the large decrease in scores for the desensitization treatment groups of the present study, it is unlikely that instrument decay in the control group would affect the treatment findings.

Weaknesses of the design which might affect generalizability involve the use of a pre-test and reactions of the subjects' to the experimental environment. It is probable that the subjects' attitudes and susceptibility to persuasion were changed by the pre-test (Campbell & Stanley, 1963, p. 18). In this study, however, 96% of the Total Sample was pre-tested; hence, the results are probably applicable to the Total Sample. Generalizing beyond the Total Sample however must remain questionable. In addition, the subjects' knowledge that they were volunteering for an experiment precludes generalizing to a clinical setting.

Summary

Although the design limitations preclude extensive generalization, this study revealed that changes in the nature of the hierarchy does affect the process of systematic desensitization. This finding indicates that it may be premature to conclude that the form of the hierarchy is unimportant to the process of desensitization and further research is warranted. The second finding indicates that general-anxiety as measured by Cattell's ASQ, does interact with the process and outcome of desensitization for test-anxiety. However, the interaction seems to be complex and further research to replicate this finding is warranted. Lastly, the findings suggest that the subscales, Covert and Overt

general-anxiety, of Cattell's Anxiety Scale Questionnaire may be measuring some unknown phenomenon which have different behavioral consequences. Further research seems warranted with regards to the relationship between the Anxiety Scale Questionnaire and measures of test-anxiety.

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APPENDIX A

INSTRUMENTS

PROJECT INFORMATION

The purpose of this project is to examine the relationships between examination anxiety and personality. The researcher is currently completing his Doctorate in Counselling Psychology at the University of Alberta and the project will assist him in completing his degree.

Many people find that their performance on examination is negatively affected by nervous tension or exam anxiety. It is the purpose of the attached questionnaire to help pinpoint personality variables related to examination stress. Therefore, it is very important that you complete the questionnaire.

Early in the fall you will be informed of the results of the questionnaire. If it is indicated that stress may be negatively affecting <u>your</u> examination performance, a method of reducing this anxiety will be offered to you on a <u>voluntary</u> basis. Filling in the questionnaire now in no way obligates you to participate later. For the present I am hoping that you will give me twenty to thirty minutes of your time to fill in the enclosed questionnaires.

By participating in the project now you will have hopefully made at least a small contribution to our understanding of human psychology. Should you choose to volunteer for the later section of the study, you can expect to perform better on exams, obtain higher grades and be more comfortable in the university environment.

Confidential Information

The following information and your responses to the following questionnaire will be kept strictly confidential and used only for the current research project. (PLEASE PRINT).

1. Name_____ 2. Date_____

3. Address_____

4. Sex_____ 5. Age_____ 6. Phone No._____

7. High School attended_____

8. Father's occupation_____

9. Father's address_____

10. Mother's occupation_____

11. Mother's address_____

12. Permanent Mailing Address_____

13. (a) Within the last 12 months, have you been seen by a psychologist or psychiatrist for a school-related problem? Yes____ No_____

(b) If yes, approximately how many times?_____

(c) Are you currently taking tranquilizers to reduce anxiety?

Yes____ No_____

14. (a) Do you feel that exam anxiety affects your performance on exam or study habits negatively? Yes_____ No_____

(b) If yes, would you consider it worthwhile to devote 8 to 10 hours of your time to a program to reduce exam anxiety? A yes response does not indicate you are committing yourself to such a program.

Yes____ No_____

In the following questionnaire try to answer each question quickly without giving a lot of thought to each question. Your first reaction will probably be the best response. Most people find they are able to finish the questionnaire within 20 to 30 minutes. Remember, that there are no correct answers to the questions.

Should you wish to know the meaning of your scores, they may be obtained from the researcher at the end of the project by contacting Mr. Roger Davis at 432-5205.

IPAT

NAME_____ Date_____

Sex_____ Age_____ Class_____
(Write M or F)

Father's Occupation_____ Your Phone No._____

In the following questionnaire you will find forty questions dealing with difficulties that most people experience at one time or another. It will help a lot in self-understanding if you check Yes, No, etc., to each, frankly and truthfully, to describe any problems you may have.

Start with the two simple examples just below, for practice. As you see, each inquiry is actually put in the form of a sentence. By marking one of the three responses you show how each statement applies to you.

Examples:

1. I enjoy walking ..... Yes Occasionally No

1.___ 2.___ 3.___

A middle response is provided for when you cannot definitely say Yes or No. But use it as little as possible.

2. I would rather spend an evening:
(1) talking to people, (3) at a move... In Between

1.___ 2.___ 3.___

About half the items inside end in 1 and 3 choices like this. 3 is always on the right. Remember, use the "In Between" or "Uncertain response only if you cannot possible decide on 1 or 3.

Now:

1. Make sure you have put your name, and whatever else the examiner asks, in the place at the top of this page.

2. Never pass over an item but give some answer to every single one. Your answers will be entirely confidential.

3. Do not spend time pondering. Answer each immediately, the way you want to at this moment (not last week, or usually). You may have answered questions like this before; but answer them as you feel now.

Most people finish in five minutes; some in ten. As soon as the examiner signals or tells you to, turn the page and begin.

STOP HERE - WAIT FOR SIGNAL

1. I find that my interests, in people and amusements, tend to change fairly rapidly.....

2. If people think poorly of me I can still go on quite serenely in my own mind.....

3. I like to wait till I am sure that what I am saying is correct, before I put forward an argument.....

4. I am inclined to let my actions get swayed by feelings of jealousy .....

5. If I had my life to live over again I would: (1) plan very differently, (3) want it the same.....

6. I admire my parents in all important matters.....

7. I find it hard to "take 'no' for an answer," even when I know what I ask is impossible.....

8. I doubt the honesty of people who are more friendly than I would naturally expect them to be.....

9. In demanding and enforcing obedience my parents (or guardians) were: (1) always very reasonable, (3) often unreasonable.....

10. I need my friends more than they seem to need me.....

11. I feel sure that I could "pull myself together" to deal with an emergency.....

12. As a child I was afraid of the dark.....

13. People sometimes tell me that I show my excitement in voice and manner too obviously.....

14. If people take advantage of my friendliness I: (1) soon forget and forgive, (3) resent it and hold it against them.....

15. I find myself upset rather than helped by the kind of personal criticism that many people make.....

16. Often I get angry with people too quickly.....

17. I feel restless as if I want something but do not know what.....

18. I sometimes doubt whether people I am talking to are really interested in what I am saying.....

19. I have always been free from any vague feelings of ill-health, such as obscure pains, digestive upsets, awareness of heart action, etc. .....

CONTINUE ON NEXT PAGE

20. In discussion with some people, I get so annoyed that I can hardly trust myself to speak.....

21. Through getting tense I use up more energy than most people in getting things done.....

22. I make a point of not being absent-minded or forgetful of details....

23. However difficult and unpleasant the obstacles, I always stick to my original intentions.....

24. I tend to get over-excited and "rattled" in upsetting situations.....

25. I occasionally have vivid dreams that disturb my sleep.....

26. I always have enough energy when faced with difficulties.....

27. I sometimes feel compelled to count things for no particular purpose .....

28. Most people are a little queer mentally, though they do not like to admit it.....

29. If I make an awkward social mistake I can soon forget it.....

30. I feel grouchy and just do not want to see people: (1) occasionally, (3) rather often.....

31. I am brought almost to tears by having things go wrong.....

32. In the midst of social groups I am nevertheless sometimes overcome by feelings of lineliness and worthlessness.....

33. I wake in the night and, through worry, have some difficulty in sleeping again.....

34. My spirits generally stay high no matter how many troubles I meet....

35. I sometimes get feelings of guilt or remorse over quite small matters .....

36. My nerves get on edge so that certain sounds, e.g., a screechy hinge, are unbearable and give me the shivers.....

37. If something badly upsets me I generally calm down again quite quickly.....

38. I tend to tremble or perspire when I think of a difficult task ahead .....

39. I usually fall asleep quickly, in a few minutes, when I go to bed....

40. I sometimes get in a state of tension or turmoil as I think over my recent concerns and interests.....

TABS

The next 50 items refer to experiences surrounding test situations or examinations that often cause people some apprehension. For each item, mark the answer sheet with the response which describes how much you are bothered by it nowadays. A response of:

1. means Not at all
2. means A little
3. means A fair amount
4. means Much
5. means Very much

Work quickly, mark an answer for every item, and consider each item individually.

1. Going into a regularly scheduled class period in which the teacher asks the students to participate.
2. Re-reading the answers I gave on the test before turning it in.
3. Sitting down to study before a regularly scheduled class.
4. Turning my completed test paper in.
5. Hearing the announcement of a coming test.
6. Having a test returned.
7. Reading the first question on a final exam.
8. Studying for a class in which I am scared of the professor.
9. Being in class waiting for my corrected test to be returned.
10. Seeing a test question and not being sure of the answer.
11. Studying for a test the night before.
12. Waiting to enter the room where a test is to be given.
13. Waiting for a test to be handed out.
14. Being called on to answer a question in class by a professor who scares me.
15. Waiting for the day my corrected test will be returned.
16. Discussing with the professor an answer I believed to be right which was marked wrong.
17. Seeing my standing on the exam relative to other people's standing.
18. Waiting to see my grade on the test.

19. Studying for a quiz.

20. Studying for a midterm.

21. Studying for a final.

22. Discussing my approaching test with friends a few weeks before the test is due.

23. After the test, listening to the answers which my friends selected.

24. Looking at the clock to see how much time remains during an exam.

25. Seeing the number of questions that need to be answered in the test.

26. On an essay exam, seeing a question I cannot answer.

27. On a multiple choice test, seeing a question I cannot answer.

28. Being asked by someone if I am ready for a forthcoming exam.

29. Being the first one to finish an exam and turn it in.

30. Being asked by a friend concerning my standing in a class.

31. Being asked by a friend concerning results of a test on which I did poorly.

32. Discovering I need a high grade on the next exam in order to pass the course.

33. Discovering I need a high grade on the final exam to maintain the average necessary to graduate from school.

34. Thinking about "warning slips" from the Dean's office.

35. Reading a "warning slip" from the Dean's office.

36. Remembering my past reactions while preparing for another test.

37. Seeking out the professor for advice or help.

38. Being told to see the professor concerning some aspect of my class work.

39. Asking for a make-up exam after missing the scheduled exam.

40. Discussing the course content with the fellow students just before entering the classroom the day of the exam.

41. Being the last one to finish an exam and turn it in.

42. Reviewing study materials the night before an exam.

43. On the first day of the course, hearing the professor announce the dates of the midterm and final examination.

44. Having the teacher ask a question of the class which deals with the course material, and then look in my direction.

45. Making an appointment to see the professor regarding some course problem.

46. Thinking about a coming exam 3 weeks before its scheduled date.

47. Thinking about a coming exam 1 week before its scheduled date.

48. Thinking about a coming exam the weekend before its scheduled date.

49. Thinking about a coming exam the night before its scheduled date.

50. Thinking about a coming exam the hour before its scheduled time.

APPENDIX B

FACTOR ANALYSIS OF SUINN'S TABS

TABLE 1

ITEM CLUSTERS BASED UPON A FOUR FACTOR VARIMAX SOLUTION
FOUND IN SUINN'S TEST ANXIETY BEHAVIORAL SCALE

Situational Test Anxiety	Anticipating Consequences	Peer Evaluation Anxiety	Authority-Figure Evaluation
8	2	22	1
10	3	23	16
12	4	24	34
13	5	25	35
14	6	28	37
26	7	29	38
27	9	30	39
32	11	31	44
33	15	36	45
47	18	40	
48	19	41	
49	20	46	
50	21		
	42		
	43		

TABLE 2

UNROTATED PRINCIPAL AXES FACTORS OF SUINN'S TEST ANXIETY BEHAVIORAL SCALE FOUND IN THE TOTAL SAMPLE

Question No.	Communalities	Factors			
		I	II	III	IV
1	0.359	0.396	-0.279	0.008	0.351
2	0.268	0.352	-0.312	-0.168	0.137
3	0.249	0.357	-0.307	-0.161	0.042
4	0.582	0.587	-0.376	-0.309	0.036
5	0.618	0.701	0.005	-0.355	0.017
6	0.602	0.650	-0.147	-0.398	0.023
7	0.489	0.635	0.003	-0.196	-0.217
8	0.332	0.547	0.169	-0.005	0.059
9	0.586	0.664	0.179	-0.321	-0.101
10	0.577	0.597	0.454	-0.124	-0.011
11	0.487	0.624	-0.136	-0.281	0.007
12	0.578	0.639	0.227	-0.172	-0.297
13	0.613	0.696	0.227	-0.126	-0.247
14	0.423	0.526	0.319	0.070	0.200
15	0.507	0.685	-0.065	-0.170	-0.065
16	0.522	0.575	-0.293	0.187	0.266
17	0.424	0.637	-0.123	0.029	0.046
18	0.582	0.736	-0.082	-0.181	-0.004
19	0.580	0.678	-0.310	-0.115	0.100
20	0.667	0.769	-0.042	-0.210	0.173
21	0.673	0.763	0.092	-0.242	0.152
22	0.498	0.556	-0.323	0.096	-0.276
23	0.530	0.600	-0.025	0.102	-0.399
24	0.494	0.653	-0.000	-0.095	-0.242
25	0.500	0.651	-0.026	0.093	-0.259
26	0.565	0.551	0.508	-0.033	0.046
27	0.359	0.525	0.242	0.131	-0.086
28	0.522	0.586	-0.146	0.224	-0.328
29	0.381	0.439	0.214	0.301	-0.230
30	0.505	0.605	-0.041	0.277	-0.246
31	0.446	0.560	0.196	0.284	-0.118
32	0.670	0.616	0.498	-0.039	0.205
33	0.607	0.542	0.499	-0.066	0.245
34	0.383	0.438	0.210	0.274	0.268
35	0.447	0.445	0.332	0.210	0.307
36	0.429	0.603	-0.006	0.244	-0.074
37	0.679	0.637	-0.423	0.186	0.245
38	0.587	0.646	-0.022	0.253	0.323
39	0.468	0.614	-0.131	0.241	0.126
40	0.507	0.616	-0.132	0.174	-0.283
41	0.246	0.436	0.102	0.199	-0.078
42	0.602	0.686	-0.357	-0.067	0.012
43	0.420	0.605	-0.231	-0.005	-0.024
44	0.450	0.613	0.006	0.209	0.174
45	0.623	0.587	-0.333	0.273	0.305

Question No.	Communalites	Factors			
		I	II	III	IV
46	0.540	0.627	-0.316	0.160	-0.145
47	0.566	0.748	-0.034	0.059	-0.036
48	0.609	0.776	0.057	0.018	0.058
49	0.636	0.759	0.210	-0.077	0.096
50	0.547	0.681	0.282	-0.059	-0.007
% Common Variance	100.000	73.505	12.009	7.280	7.206
% Total Variance	51.070	37.539	6.133	3.718	3.680

TABLE 3

VARIMAX ROTATED FACTORS OF SUINN'S TEST ANXIETY BEHAVIORAL SCALE FOUND AMONGST THE TOTAL SAMPLE

Question No.	Communalities	Factors			
		I	II	III	IV
1	0.359	0.084	0.316	-0.022	0.502
2	0.268	-0.019	0.437	0.033	0.275
3	0.249	-0.038	9.435	0.107	0.217
4	0.582	0.033	0.698	0.171	0.256
5	0.618	0.395	0.644	0.195	0.095
6	0.602	0.250	0.707	0.156	0.125
7	0.489	0.287	0.495	0.401	0.002
8	0.332	0.442	0.236	0.229	0.167
9	0.586	0.480	0.532	0.264	-0.054
10	0.577	0.681	0.240	0.231	-0.046
11	0.487	0.235	0.603	0.205	0.160
12	0.578	0.445	0.394	0.455	-0.134
13	0.613	0.488	0.390	0.470	-0.057
14	0.423	0.587	0.108	0.139	0.219
15	0.507	0.300	0.528	0.334	0.161
16	0.522	0.136	0.289	0.214	0.612
17	0.424	0.251	0.376	0.322	0.340
18	0.582	0.331	0.570	0.313	0.222
19	0.579	0.144	0.577	0.254	0.401
20	0.667	0.431	0.590	0.187	0.313
21	0.673	0.530	0.558	0.175	0.223
22	0.498	-0.044	0.367	0.557	0.228
23	0.530	0.183	0.271	0.649	0.037
24	0.494	0.275	0.293	0.559	0.142
25	0.500	0.248	0.304	0.571	0.141
26	0.565	0.713	0.125	0.203	-0.005
27	0.359	0.443	0.098	0.378	0.103
28	0.522	0.093	0.221	0.654	0.192
29	0.381	0.327	-0.061	0.514	0.078
30	0.505	0.208	0.149	0.621	0.232
31	0.446	0.409	0.024	0.490	0.194
32	0.670	0.783	0.166	0.120	0.122
33	0.607	0.757	0.144	0.041	0.105
34	0.383	0.463	-0.049	0.143	0.381
35	0.447	0.578	-0.047	0.081	0.322
36	0.429	0.285	0.155	0.479	0.308
37	0.679	0.059	0.376	0.271	0.679
38	0.587	0.404	0.171	0.220	0.588
39	0.468	0.245	0.209	0.349	0.493
40	0.507	0.136	0.268	0.614	0.201
41	0.246	0.283	0.054	0.366	0.171
42	0.602	0.084	0.567	0.346	0.393
43	0.420	0.130	0.428	0.349	0.314
44	0.450	0.370	0.177	0.289	0.446

Question No.	Communalities	Factors			
		I	II	III	IV
46	0.623	0.118	0.247	0.234	0.703
47	0.540	0.032	0.354	0.528	0.367
47	0.566	0.357	0.381	0.447	0.306
48	0.609	0.472	0.389	0.368	0.315
49	0.636	0.600	0.389	0.278	0.216
50	0.547	0.587	0.306	0.314	0.098
% Common Variance	100.000	28.908	27.977	25.404	17.711
% Total Variance	51.070	14.763	14.288	12.974	9.045

APPENDIX C

CORRELATIONAL DATA

TABLE 1

CORRELATIONS BETWEEN THE TEST ANXIETY SCALES AND THE GENERAL ANXIETY SCALES FOUND IN THE TOTAL SAMPLE (N=584)

	Suinn's Test Anxiety					Cattell's Anxiety Scale Questionnaire							
SCALE	TTA	STA	ACA	PEA	AEA	Q3	C	L	O	Q4	A	B	A+B
TTA	1.00	85	89	87	88	28	14	17	38	37	30	40	39
STA		1.00	68	66	67	24	--	--	28	33	23	32	30
ACA			1.00	72	78	21	15	14	33	31	23	36	33
PEA				1.00	74	28	13*	21	38	38	32	40	40
AEA					1.00	25	13*	19	36	35	28	39	38
Q3						1.00	30	24	51	53	68	64	73
C							1.00	35	39	41	56	56	52
L								1.00	40	31	50	49	55
O									1.00	60	74	77	84
Q4										1.00	72	78	84
A											1.00	61	89
B												1.00	91
A+B													1.00

* $p < .05$; all other r, $p < .01$

TABLE 2

CORRELATIONS BETWEEN THE TEST ANXIETY AND THE
GENERAL ANXIETY SCALES FOUND IN THE TARGET SAMPLE (N=274)

	Suinn's Test Anxiety					IPAT Anxiety Scale Questionnaire							
SCALES	TTA	STA	ACA	PEA	AEA	Q3	C	L	O	Q4	A	B	A+B
TTA	1.00	61	78	70	77	12*	--	--	22	21	--	21	19
STA		1.00	30	28	35	14*	--	-14*	12*	22	--	14*	12*
ACA			1.00	38	58	--	--	--	12*	--	--	--	--
PEA				1.00	50	16	--	--	21	25	19	24	24
AEA					1.00	13*	--	17	22	20	19	22	23
Q3						1.00	25	16	44	47	64	60	70
C							1.00	36	34	33	58	48	60
L								1.00	35	36	47	44	52
O									1.00	53	68	75	81
Q4										1.00	68	75	81
A											1.00	57	88
B												1.00	89
A+B													1.00

* $p < .05$; all other r, $p < .01$

TABLE 3

CORRELATIONS BETWEEN THE TEST ANXIETY AND THE
GENERAL-ANXIETY SCALES FOUND IN THE TREATMENT SAMPLE (N=128)

	Suinn's Test Anxiety					IPAT Anxiety Scale Questionnaire							
SCALE	TTA	STA	ACA	PEA	AEA	Q3	C	L	O	Q4	A	B	A+B
TTA	1.00	62	81	66	79	--	--	--	21*	--	--	25	19*
STA		1.00	35	19*	38	--	-23	--	--	--	--	--	--
ACA			1.00	31	54	--	21*	--	--	--	--	23	--
PEA				1.00	46	19*	--	--	22	--	--	21*	21*
AEA					1.00	--	--	--	20*	--	--	21*	20*
Q3						1.00	21*	--	48	48	63	65	71
C							1.00	21*	37	29	53	48	56
L								1.00	40	24	46	38	47
O									1.00	48	76	76	84
Q4										1.00	66	74	78
A											1.00	62	90
B												1.00	91
A+B													1.00

* $p < .05$; all other r, $p < .01$

TABLE 4

CORRELATIONS BETWEEN THE TEST ANXIETY BEHAVIORAL SCALES
AND THE ANXIETY SCALE QUESTIONNAIRE SCALES
FOUND IN THE NON-VOLUNTEERS FROM THE TARGET SAMPLE (N=151)

	Suinn's Test Anxiety					IPAT Anxiety Scale Questionnaire							
SCALE	TTA	STA	ACA	PEA	AEA	Q3	C	L	O	Q4	A	B	A+B
TTA	1.00	61	76	73	77	--	--	--	23	26	17*	17*	19*
STA		1.00	24	34	34	--	--	--	25	28	--	20	21
ACA			1.00	45	62	--	--	--	--	--	--	--	--
PEA				1.00	53	--	--	--	21*	36	21*	25	26
AEA					1.00	--	--	23	24	23	22	22	25
Q3						1.00	28	21	41	47	66	55	69
C							1.00	45	32	36	62	48	63
L								1.00	32	28	48	49	55
O									1.00	58	62	74	78
Q4										1.00	69	75	83
A											1.00	53	87
B												1.00	88
A+B													1.00

* $p < .05$; all other r, $p < .01$

TABLE 5

FISCHERS Z TEST OF SIGNIFICANT DIFFERENCES IN CORRELATIONS BETWEEN THE TREATMENT VOLUNTEERS (N=128) AND NON-VOLUNTEERS (N=151) ON THE GENERAL ANXIETY AND TEST ANXIETY SCALES

	Suinn's Test Anxiety					IPAT Anxiety Scale Questionnaire							
SCALE	TTA	STA	ACA	PEA	AEA	Q3	C	L	O	Q4	A	B	A+B
TTA	0.00	0.13	1.08	-1.12	0.42	0.42	0.99	-0.17	-0.17	-1.03	-0.67	0.69	0.00
STA		0.00	0.99	-1.33	0.38	0.42	-1.58	-1.35	-2.18*	-1.21	-1.58	-1.18	-1.59
ACA			0.00	-1.35	-0.99	0.41	2.59**	0.41	0.75	-0.08	*0.08	2.01*	1.08
PEA				0.00	-0.77	0.42	0.17	0.42	0.09	-2.28*	-0.42	-0.35	-0.44
AEA					0.00	-0.08	0.33	-1.19	-0.35	-0.60	-0.68	-0.09	-0.43
Q3						0.00	-0.61	-0.93	0.72	0.11	-0.42	1.29	0.32
C							0.00	-2.24*	0.47	-0.65	-1.11	0.00	-0.90
L								0.00	0.76	-0.35	-0.21	-1.12	-0.89
O									0.00	-1.15	2.24*	0.38	1.45
Q4										0.00	-.0.46	-0.19	-1.18
A											0.00	1.11	1.15
B												0.00	1.25
A+B													0.00

* $-1.96 \geq Z \geq +1.96$, $p < .05$; ** $-2.58 \geq Z \geq +2.58$, $p < .01$

APPENDIX D

DESENSITIZATION DESCRIPTION

You have kindly consented to participate in a therapeutic sequence, selected to reduce the high level of anxiety experienced as a consequence of taking examinations. The main objective of this first session is to familiarize you with the underlying theoretical rationale, which justifies the application of the therapeutic approach we are about to employ. I would appreciate it if you would refrain from verbalizing any reaction until the conclusion of our final session, whereupon there will be ample opportunity for discussion and evaluation, if you so desire.

The method, termed systematic desensitization, was originally devised by Joseph Wolpe. His theoretic posture is predicated upon the assumption that the acquisition of anxiety, like any other behavior, can be explained in terms of established principles of learning. Let me illustrate with an old-fashioned example. A child places his hand on the hot coal stove. He quickly withdraws the painful hand, tearful and fearful. His mother comforts him, but later notes that he keeps away from the stove and seems afraid of it. Clearly the child has learned a beneficial habit of fearing and avoiding an actually harmful object. A moment's reflection will bring to mind many instances demonstrating the obvious utility of this kind of conditioning-- for example, walking alone and unprotected at night in a neighborhood of ill-repute, learning that one's employer is about to dismiss some of his staff, or being confronted with a mad dog. Nobody would come to treatment because he experiences anxiety on such occasions. However, it is a different matter when anxiety is aroused by experience that contain no real threat - such as seeing an ambulance, crossing the

street, or entering a crowded room. To be extremely anxious in such situations is obviously inappropriate, and can interfere with daily functioning in a most distressing way, as in the case with excessive anxiety contingent upon taking examinations. In all likelihood, you have experienced, for any one of a number of possible reasons, an intense anxiety reaction while writing examinations. In accordance with the principles of conditioning all subsequent efforts have elicited a similar response. It is the task of desensitization therapy to detach your anxiety from the situations that provoke it, or, in other words, enable you to learn behavior which will inhibit such maladaptive responses.

Desensitization has been chosen on account of the wealth of clinical and experimental evidence attesting to its efficacy in effecting long-lasting resolution of situational anxiety. The treatment rests on the premise that deep muscle relaxation has effects which are antagonistic to anxiety. The initial phase includes training in relaxation and the construction of an hierarchy of anxiety-provoking stimuli, relating to examinations.

APPENDIX E

RELAXATION EXERCISE

RELAXATION EXERCISE

Settle back as comfortably as you can. Let yourself relax to the best of your ability . . . . Now, as you relax like that, clench your right fist, just clench your fist tighter and tighter, and study the tension as you do so. Keep it clenched and feel the tension in your right fist, hand, forearm . . . and now relax. Let the fingers of your right hand become loose, and observe the contrast in your feelings . . . . Now let yourself go and try to become more relaxed all over . . . Once more, clench your right fist really tight . . . hold it, and notice the tension again . . . . Now let go, relax; your fingers straighten out and you notice the difference once more . . . . Now repeat that with your left fist. Clench your left fist while the rest of your body relaxes; clench that fist tighter and feel the tension . . . and now relax. Again enjoy the contrast . . . . Repeat that once more, clench the left fist first, tight and tense . . . . Now do the opposite of tension; relax and feel the difference. Continue relaxing your hands and forearms more and more . . . . Now bend your elbows and tense your biceps, tense them harder and study the tension feelings . . . all right, straighten out your arms, let them relax and feel that difference again. Let the relaxation develop . . . . Once more, tense your biceps; hold the tension and observe it carefully . . . . Straighten the arms and relax; relax to the best of your ability . . . . Each time, pay close attention to your feelings when you tense up and when you relax. Now straighten your arms, straighten them so that you feel most tension in the triceps muscles along the back of your arms; stretch your arms and feel that tension . . . . And now relax. Get your arms back into a comfortable position. Let the relaxation proceed on its own. The arms should feel

comfortably heavy as you allow them to relax . . . . Straighten the arms once more so that you feel the tension in the triceps muscles; straighten them. Feel that tension . . . and relax. Now let's concentrate on pure relaxation in the arms without any tension. Get your arms comfortable and let them relax further and further. Continue relaxing your arms ever further. Even when your arms seem fully relaxed, try to go that extra bit further; try to achieve deeper and deeper levels of relaxation.

Let all your muscles go loose and heavy. Just settle back quitely and comfortably. Wrinkle up your forehead now; wrinkle it tighter . . . And now stop wrinkling your forehead, relax and smooth it out. Picture the entire forehead and scalp becoming smoother as the relaxation increases . . . . Now frown and crease your brows and study the tension . . . Let go of the tension again. Smooth out the forehead once more . . . Now, close your eyes tighter and tighter . . . feel the tension . . . and relax your eyes. Keep your eyes closed, gently, comfortably, and notice the relaxation . . . . Now clench your jaws, bite your teeth together; study the tension throughout the jaws . . . . Relax your jaws now. Let your lips part slightly . . . . Appreciate the relaxation . . . . Now press your tongue hard against the roof of your mouth. Look for the tension . . . . All right, let your tongue return to a comfortable and relaxed position . . . . Now purse your lips, press your lips together tighter and tighter . . . . Relax the lips. Note the contrast between tension and relaxation. Feel the relaxation all over your face, all over your forehead and scalp, eyes, jaws, lips, tongue and throat. The relaxation progresses further and further . . . . Now attend to your neck muscles. Press your head back as far as it can go and feel the tension in the neck; roll it to the

right and feel the tension shift; now roll it to the left. Straighten your head and bring it forward, press your chin against your chest. Let your head return to a comfortable position, and study the relaxation. Let the relaxation develop . . . . Shrug your shoulders, right up. Hold the tension . . . . Drop your shoulders and feel the relaxation. Neck and shoulders relaxed . . . . Shrug your shoulders again and move them around. Bring your shoulders up and forward and back. Feel the tension in your shoulders and in your upper back . . . . Drop your shoulders once more and relax. Let the relaxation spread deep into the shoulders, right into your back muscles; relax your neck and throat, and your jaws and other facial areas as the pure relaxation takes over and grows deeper . . . deeper . . . ever deeper.

Relax your entire body to the best of your ability. Feel that comfortable heaviness that accompanies relaxation. Breathe easily and freely in and out. Notice how the relaxation increases as you exhale . . . as you breathe out just feel that relaxation . . . . Now breathe right in and fill your lungs; inhale deeply and hold your breath. Study the tension. Now exhale, let the walls of your chest grow loose and push the air out automatically. Continue relaxing and breathe freely and gently. Feel the relaxation and enjoy it . . . . With the rest of your body as relaxed as possible, fill your lungs again. Breathe in deeply and hold it again . . . . That's fine, breathe out and appreciate the relief. Just breathe normally. Continue relaxing your chest and let the relaxation spread to your back, shoulders, neck and arms. Merely let go . . . and enjoy the relaxation. Now lets pay attention to your abdominal muscles, your stomach area. Tighten your stomach muscles make your abdomen hard. Notice the tension . . . . And relax. Let the

muscles loosen and notice the contrast . . . . Once more, press and tighten your stomach muscles. Hold the tension and study it . . . . And relax. Notice the general well-being that comes with relaxing your stomach . . . . Now draw your stomach in, pull the muscles right in and feel the tension this way . . . . Now relax again. Let your stomach out. Continue breathing normally and easily and feel the gentle massaging action all over your chest and stomach . . . . Now pull your stomach in again and hold the tension . . . . Now push out and tense like that; hold the tension . . . once more pull in and feel the tension . . . now relax your stomach fully. Let the tension dissolve as the relaxation grows deeper. Each time you breathe out, notice the rhythmic relaxation both in your lungs and in your stomach. Notice thereby how your chest and your stomach relax more and more . . . . Try and let go of all contractions anywhere in your body . . . . Now direct your attention to your lower back. Arch up your back, make your lower back quite hollow, and feel the tension along your spine . . . and settle down comfortably again relaxing the lower back . . . . Just arch your back up and feel the tensions as you do so. Try to keep the rest of your body as relaxed as possible. Try to localize the tension through out your lower back area. Relax once more, relaxing further and further. Relax your lower back, relax your upper back, spread the relaxation to your stomach, chest, shoulders, arms and facial area. These parts relaxing further and further and further and ever deeper.

Let go of all tensions and relax . . . . Now flex your buttocks and thighs. Flex your thighs by pressing down your heels as hard as you can . . . . Relax and note the difference . . . . Straighten your knees and flex your thigh muscles again. Hold the tension . . . . Relax your

hips and thighs. Allow the relaxation to proceed on its own . . . . Press your feet and toes downwards, away from your face, so that your calf muscles become tense. Study that tension . . . . Relax your feet and calves . . . . This time, bend your feet towards your face so that you feel tension along your shins. Bring your toes right up . . . . Relax again. Keep relaxing for awhile . . . . Now let yourself relax further all over. Relax your feet, ankles, calves and shins, knees, thighs, buttocks and hips. Feel the heaviness of your lower body as you relax still further . . . . Now spread the relaxation to your stomach, waist, lower back. Let go more and more. Feel that relaxation all over. Let it proceed to your upper back, chest shoulders and arms and right to the tips of your fingers. Keep relaxing more and more deeply. Make sure that no tension has crept into your throat; relax your neck and your jaws and all your facial muscles. Keep relaxing your whole body like that for a while. Let yourself relax.

Now you can become twice as relaxed as you are merely by taking in a really deep breath and slowly exhaling. With your eyes closed so that you become less aware of objects and movements around you and thus prevent any surface tension from developing, breathe in deeply and feel yourself becoming heavier. Take in a long, deep breath and let it out very slowly . . . . Feel how heavy and relaxed you have become.

In a state of perfect relaxation you should feel unwilling to move a single muscle in your body. Think about the effort that would be required to raise your right arm. As you think about raising your right arm, see if you can notice any tension that might have crept into your shoulder and your arm . . . . Now you decide not to lift the arm but to continue relaxing. Observe the relief and the disappearance of the

tension . . . .

Just carry on relaxing like that. When you wish to get up, count backwards from four to one. You should then feel fine and refreshed, wide awake and calm.

APPENDIX F

COMPOSITE HIERARCHY

COMPOSITE HIERARCHY

1. Re-reading the answers I gave on the test before turning it in.
2. Turning in my completed test paper.
3. Discussing the course content with fellow students just before entering the room the day of the test.
4. Being the first one to finish an exam and turn it in, being the first one to finish an exam and turn it in.
5. Reviewing study materials the night before an exam.
6. Reading the first question on a final.
7. After the test, listening to the answers which my friends selected.
8. Thinking about a coming exam 1 week before its scheduled date.
9. Waiting for the test to be handed out.
10. On a multiple choice test, seeing a question I cannot answer.
11. Seeing the number of questions that need to be answered on the test.
12. Waiting to enter the room where a test is to be given.
13. Looking to see how much time remains during an exam.
14. Thinking about a coming exam the weekend before its scheduled date.
15. Thinking about a coming exam the night before its scheduled date.
16. Thinking about a coming exam the hour before its scheduled time.
17. Seeing a test question and not being sure of the answer.
18. Studying for a final.
19. On an essay exam, seeing a question I cannot answer.
20. Discovering I need a high grade on the exam in order to pass the course.
21. Seeking out the professor for advice or help.

APPENDIX G

ANCOVA TABLES

Table 1

MODIFIED AND STANDARD HIERARCHY GROUP MEANS
BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B)
ON PRE AND POST-ADMINISTERED
TOTAL TEST ANXIETY (TTA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	TTA	MH	104.36	11	117.86	14
		SH	96.90	20	120.80	15
Post	TTA	MH	93.18	11	68.75	14
		SH	61.35	20	61.35	15

Table 2

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED
TOTAL TEST ANXIETY (TTA) SCORES
FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH
TOTAL GENERAL ANXIETY (ASQ.A+B).

Source of variation	SS	df	MS	F	P
Treatment	2,337.75	1	2,337.75	3.37	.07
Anxiety	4,028.73	1	4,028.73	5.81	.02
Treatment X Anxiety	308.71	1	308.71	0.45	.51
Covariate[1]	7,715.75	1	7,715.75	11.13	.002
Errors	38,113.00	55	692.96		

[1] Covariate used was pre-tested Total Test Anxiety scores.

Table 3

MODIFIED AND STANDARD HIERARCHY GROUP MEANS
BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B)
ON PRE AND POST-ADMINISTERED
SITUATIONAL TEST ANXIETY (STA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	STA	MH	48.00	11	54.57	14
		SH	49.45	20	53.80	15
Post	STA	MH	41.27	11	37.21	14
		SH	35.30	20	34.93	15

Table 4

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED
SITUATIONAL TEST ANXIETY (STA) SCORES
FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH
TOTAL GENERAL ANXIETY (ASQ.A+B).

Source of variation	SS	df	MS	F	p
Treatment	248.38	1	248.38	3.52	.06
Anxiety	96.13	1	96.13	1.36	.25
Treatment X Anxiety	55.05	1	55.05	0.78	.38
Covariate[1]	28.96	1	28.96	0.41	.52
Errors	3,885.63	55	10.65		

[1] Covariate used was pre-tested Situational Test Anxiety scores.

Table 5

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B) ON PRE AND POST-ADMINISTERED ANTICIPATING CONSEQUENCES ANXIETY (ACA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	ACA	MH	45.91	11	48.86	14
		SH	39.70	20	49.93	15
Post	ACA	MH	40.55	11	34.86	14
		SH	31.35	20	32.00	15

Table 6

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED ANTICIPATING CONSEQUENCE ANXIETY (ACA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B).

Source of variation	SS	df	MS	F	P
Treatment	353.99	1	353.99	6.24	.02
Anxiety	344.79	1	344.79	6.08	.02
Treatment X Anxiety	41.28	1	41.28	0.73	.39
Covariate[1]	1,001.98	1	1,001.98	17.67	.001
Errors	3,119.50	55	56.72		

[1] Covariate used was pre-tested Anticipating Consequences Anxiety scores.

Table 7

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B) ON PRE AND POST-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	PEA	MH	35.55	11	38.29	14
		SH	32.95	20	35.27	15
Post	PEA	MH	29.36	11	24.79	14
		SH	25.55	20	23.20	15

Table 8

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B).

Source of variation	SS	df	MS	F	P
Treatment	43.63	1	43.63	0.94	.33
Anxiety	254.69	1	254.69	5.49	.02
Treatment X Anxiety	20.06	1	20.06	0.43	.51
Covariate[1]	272.23	1	272.23	5.87	.02
Errors	2,552.82	55	46.41		

[1] Covariate used was pre-tested Peer Evaluation Test Anxiety scores.

Table 9

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B) ON PRE AND POST-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	AEA	MH	21.91	11	22.71	14
		SH	21.95	20	26.60	15
Post	AEA	MH	19.36	11	19.36	14
		SH	17.20	20	16.27	15

Table 10

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B).

Source of variation	SS	df	MS	F	P
Treatment	178.59	1	178.59	5.94	.02
Anxiety	43.39	1	43.39	1.44	.23
Treatment X Anxiety	24.39	1	24.39	0.81	.37
Covariate[1]	286.41	1	286.41	9.53	.003
Errors	1,653.43	55	30.06		

[1] Covariate used was pre-tested Authority Evaluation Anxiety scores.

Table 11

MODIFIED AND STANDARD HIERARCHY GROUP MEANS
BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A)
ON PRE AND POST-ADMINISTERED
TOTAL TEST ANXIETY (TTA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety: Low	N	High	N
Pre	TTA	MH	108.31	13	115.83	12
		SH	97.95	21	120.93	14
Post	TTA	MH	66.23	13	83.67	12
		SH	60.71	21	62.43	14

Table 12

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED
TOTAL TEST ANXIETY (TTA) SCORES
FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH
COVERT GENERAL ANXIETY (ASQ.A).

Source of variation	SS	df	MS	F	p
Treatment	2,117.39	1	2,117.39	2.88	.09
Anxiety	88.86	1	88.86	0.12	.73
Treatment X Anxiety	1,785.39	1	1,785.39	2.43	.12
Covariate[1]	4,899.16	1	4,899.16	6.66	.01
Errors	40,459.38	55	735.63		

[1] Covariate used was pre-tested Total Test Anxiety scores.

Table 13

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND POST-ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety			
			Low	N	High	N
Pre	STA	MH	50.31	13	53.17	12
		SH	49.95	21	53.36	14
Post	STA	MH	36.31	13	41.92	12
		SH	35.14	21	35.14	14

Table 14

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW HIGH COVERT GENERAL ANXIETY (ASQ.A).

Source of variation	SS	df	MS	F	P
Treatment	225.67	1	225.67	3.25	.08
Anxiety	108.15	1	108.15	1.56	.22
Treatment X Anxiety	112.50	1	112.50	1.62	.21
Covariate[1]	0.05	1	0.05	0.00	.98
Errors	3,816.75	55	69.40		

[1] Covariate used was pre-tested Situational Text Anxiety scores.

Table 15

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND POST-ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety Low	N	High	N
Pre	ACA	MH	46.85	13	48.33	12
		SH	40.14	21	50.00	14
Post	ACA	MH	34.31	13	40.67	12
		SH	31.29	21	32.14	14

Table 16

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A).

Source of variation	SS	df	MS	F	P
Treatment	333.46	1	333.46	5.70	.02
Anxiety	32.12	1	32.12	0.55	.46
Treatment X Anxiety	251.28	1	251.28	4.29	.04
Covariate[1]	850.49	1	850.49	14.55	.001
Errors	3,214.94	55	58.45		

[1] Covariate used was pre-tested Anticipating Consequences Test Anxiety scores.

Table 17

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND POST-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety			
			Low	N	High	N
Pre	PEA	MH	37.46	13	36.67	12
		SH	33.24	21	35.00	14
Post	PEA	MH	25.62	13	28.08	12
		SH	25.24	21	23.50	14

Table 18

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A).

Source of variation	SS	df	MS	F	P
Treatment	36.68	1	36.68	0.74	.39
Anxiety	0.73	1	0.73	0.01	.90
Treatment X Anxiety	86.49	1	86.49	1.74	.19
Covariate[1]	213.78	1	213.78	4.31	.04
Errors	2,722.79	55	49.51		

[1] Covariate used was pre-tested Peer Evaluation Anxiety scores.

Table 19

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND POST-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety Low	N	High	N
Pre	AEA	MH	20.69	13	24.17	12
		SH	21.76	21	27.21	14
Post	AEA	MH	17.54	13	21.42	12
		SH	17.09	21	16.36	14

Table 20

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH COVERT GENERAL ANZIETY (ASQ.A).

Source of variation	SS	df	MS	F	P
Treatment	184.78	1	184.78	6.29	.02
Anxiety	2.40	1	2.40	0.08	.78
Treatment X Anxiety	107.58	1	107.58	3.66	.06
Covariate[1]	233.94	1	233.94	7.97	.01
Errors	1,615.05	55	29.36		

[1] Covariate used was pre-tested Authority Evaluation Anxiety scores.

Table 21

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND POST-ADMINISTERED TOTAL TEST ANXIETY (TTA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety Low	N	High	N
Pre	TTA	MH	102.90	10	117.93	15
		SH	95.94	18	119.00	17
Post	TTA	MH	83.20	10	68.87	15
		SH	65.50	18	57.06	17

Table 22

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED TOTAL TEST ANXIETY (TTA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source of variation	SS	df	MS	F	P
Treatment	2,321.79	1	2,321.79	3.59	.06
Anxiety	6,662.09	1	6,662.09	10.31	.002
Treatment X Anxiety	1.21	1	1.21	0.00	.97
Covariate[1]	9,882.71	1	9,882.71	15.29	.001
Errors	35,545.31	55	646.28		

[1] Covariate used was pre-tested Total Test Anxiety scores.

Table 23

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND POST-ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety Low	N	High	N
Pre	STA	MH	50.00	10	52.63	15
		SH	49.16	18	53.88	17
Post	STA	MH	40.67	10	38.06	15
		SH	37.05	18	32.88	17

Table 24

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source of variation	SS	df	MS	F	P
Treatment	271.05	1	271.05	3.93	.05
Anxiety	187.42	1	187.42	2.72	.10
Treatment X Anxiety	11.28	1	11.28	0.16	.69
Covariate[1]	33.78	1	33.78	0.49	.49
Errors	3,791.25	55	68.93		

[1] Covariate used was pre-tested Situational Test Anxiety scores.

Table 25

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND POST-ADMINISTERED ANTICIPATING CONSEQUENCES ANXIETY (ACA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety Low	N	High	N
Pre	ACA	MH	41.89	10	50.75	15
		SH	39.32	18	49.75	17
Post	ACA	MH	39.33	10	36.25	15
		SH	31.63	18	31.63	17

Table 26

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source of variation	SS	df	MS	F	P
Treatment	395.82	1	395.82	7.04	.01
Anxiety	389.51	1	389.51	6.92	.01
Treatment X Anxiety	19.49	1	19.49	0.35	.55
Covariate[1]	1,175.56	1	1,175.56	20.89	.001
Errors	3,093.75	55	56.25		

[1] Covariate used was pre-tested Anticipating Consequences Test Anxiety scores.

Table 27

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND POST-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety Low	N	High	N
Pre	PEA	MH	33.44	10	39.13	15
		SH	32.58	18	35.56	17
Post	PEA	MH	28.11	10	26.06	15
		SH	27.00	18	21.63	17

Table 28

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source of variation	SS	df	MS	F	P
Treatment	49.78	1	49.78	1.15	.29
Anxiety	361.28	1	361.28	8.37	.005
Treatment X Anxiety	17.95	1	17.95	0.42	.52
Covariate[1]	352.29	1	352.29	8.16	.006
Errors	2,375.03	55	43.18		

[1] Covariate used was pre-tested Peer Evaluation Test Anxiety scores.

Table 29

MODIFIED AND STANDARD HIERARCHY GROUP MEANS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND POST-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety			
			Low	N	High	N
Pre	AEA	MH	21.67	10	22.75	15
		SH	21.68	18	26.63	17
Post	AEA	MH	19.11	10	19.56	15
		SH	18.21	18	15.13	17

Table 30

SUMMARY OF DIFFERENCES IN ANCOVA ON POST-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source of variation	SS	df	MS	F	P
Treatment	187.92	1	187.92	7.01	.01
Anxiety	113.64	1	113.64	4.24	.04
Treatment X Anxiety	108.02	1	108.02	4.03	.05
Covariate[1]	389.48	1	389.48	14.53	.001
Errors	1,474.07	55	26.80		

[1] Covariate used was pre-tested Authority Evaluation Test Anxiety scores.

Table 31

SCHEFFE MULTIPLE COMPARISONS OF DIFFERENCES
AMONGST TREATMENTS AND TOTAL GENERAL ANXIETY (ASQ.A+B)
BETWEEN PRE-ADMINISTERED AND
FOLLOW-UP TOTAL TEST ANXIETY (TTA).

Treatment Effect	Contrasts	Variances	F	P
SH - MH	0.38	75.94	0.0009	.99
PC - MH	35.30	56.92	10.94	.001
PC - SH	34.92	44.12	13.82	.001

Table 32

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B) ON PRE AND FOLLOW-UP ADMINISTERED TOTAL TEST ANXIETY (TTA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	TTA	MH	107.56	9	115.10	10
		SH	97.87	15	122.08	12
		PC	114.26	38	109.23	30
Follow-up	TTA	MH	70.78	9	50.80	10
		SH	58.07	15	62.75	12
		PC	95.18	38	97.47	30

Table 33

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP ADMINISTERED TOTAL TEST ANXIETY (ASQ.A+B) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH TOTAL GENERAL ANXIETY (TTA).

Source of variation	SS	df	MS	F	P
Treatment	33,382.70	2	16,691.35	19.85	.001
General Anxiety	1,819.94	1	1,819.94	2.16	.14
Treatment X Anxiety	3,384.43	2	1,692.22	2.01	.14
Covariate[1]	19,084.78	1	19,084.78	22.70	.001
Errors	89,977.25	107	840.91		

[1] Covariate used was pre-tested Total Test Anxiety.

Table 34

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B) ON PRE AND FOLLOW-UP ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	STA	MH	46.14	7	53.50	10
		SH	49.13	15	54.25	12
		PC	51.51	37	51.36	28
Follow-up	STA	MH	36.00	7	31.70	10
		SH	33.87	15	37.25	12
		PC	46.60	37	47.18	28

Table 35

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B).

Source of variation	SS	df	MS	F	P
Treatment	3,613.66	2	1,806.83	23.81	.001
Total Anxiety	36.78	1	36.78	0.48	.49
Treatment X Anxiety	203.78	2	101.89	1.34	.27
Covariate[1]	632.24	1	632.24	8.33	.005
Errors	7,740.38	102	75.89		

[1] Covariate used was pre-tested Situational Test Anxiety.

Table 36

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B) ON PRE AND FOLLOW-UP ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	ACA	MH	47.57	7	46.20	10
		SH	40.33	15	50.17	12
		PC	51.16	37	48.21	28
Follow-up	ACA	MH	38.00	7	28.40	10
		SH	31.47	15	33.83	12
		PC	42.92	37	43.07	28

Table 37

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B).

Source	SS	df	MS	F	P
Treatment	1,669.85	2	834.92	9.02	.001
Total Anxiety	213.99	1	213.99	2.31	.13
Treatment X Anxiety	385.23	2	192.62	2.08	.13
Covariate[1]	2,985.89	1	2,985.89	32.26	.001
Errors	9,441.00	102	92.56		

[1] Covariate used was pre-tested Anticipating of Consequences.

Table 38

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B) ON PRE AND FOLLOW-UP ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	PEA	MH	35.29	7	39.40	10
		SH	32.93	15	34.33	12
		PC	32.54	37	34.50	28
Follow-up	PEA	MH	25.71	7	22.60	10
		SH	23.13	15	22.00	12
		PC	29.16	37	31.79	28

Table 39

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B).

Source	SS	df	MS	F	P
Treatment	1,647.14	2	832.57	14.15	.001
Total Anxiety	59.07	1	59.07	1.01	.32
Treatment X Anxiety	172.14	2	86.07	1.48	.23
Covariate[1]	1,464.00	1	1,464.00	25.15	.001
Errors	5,938.38	102	58.22		

[1] Covariate used was pre-tested Peer Evaluation Test Anxiety.

Table 40

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B) ON PRE AND FOLLOW-UP-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES.

Administration	Scale	Treatment Group	Total General Anxiety Low	N	High	N
Pre	AEA	MH	22.57	7	22.80	10
		SH	22.27	15	27.42	12
		PC	24.73	37	21.82	28
Follow-up	AEA	MH	21.29	7	16.10	10
		SH	17.33	15	18.00	12
		PC	24.00	37	22.04	28

Table 41

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH TOTAL GENERAL ANXIETY (ASQ.A+B).

Source	SS	df	MS	F	P
Treatment	763.16	2	381.58	9.01	.001
Total Anxiety	128.39	1	128.39	3.03	.08
Treatment X Anxiety	72.29	2	36.15	0.85	.43
Covariate[1]	731.87	1	731.87	17.28	.001
Errors	4,319.21	102	42.35		

[1] Covariate used was pre-tested Authority Evaluation Anxiety.

Table 42

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND FOLLOW-UP-ADMINISTERED TOTAL TEST ANXIETY (TTA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety Low	N	High	N
Pre	TTA	MH	109.67	12	114.71	7
		SH	97.87	15	122.08	12
		PC	113.92	36	109.94	32
Follow-up	TTA	MH	72.92	12	38.57	7
		SH	58.07	15	62.75	12
		PC	96.42	36	95.94	32

Table 43

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED TOTAL TEST ANXIETY (TTA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A).

Source of Variation	SS	df	MS	F	P
Treatment	37,119.75	2	18,559.88	22.82	.001
Covert Anxiety	4,388.35	1	4,388.35	5.40	.02
Treatment X Anxiety	5,297.82	2	2,648.91	3.26	.04
Covariate[1]	18,793.86	1	18,793.86	23.11	.001
Errors	87,025.19	107	813.32		

[1] Covariate used was pre-tested Total Test Anxiety.

Table 44

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND FOLLOW-UP-ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety Low	N	High	N
Pre	STA	MH	49.00	10	52.57	7
		SH	49.13	15	54.25	12
		PC	51.17	35	51.77	30
Follow-up	STA	MH	36.80	10	28.71	7
		SH	33.87	15	37.25	12
		PC	46.69	35	47.03	30

Table 45

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A).

Source of Variation	SS	df	MS	F	P
Treatment	3,999.16	2	1,999.58	26.93	.001
Covert Anxiety	109.96	1	109.96	1.48	.23
Treatment X Anxiety	349.55	2	174.77	2.35	.10
Covariate[1]	606.58	1	606.58	8.17	.005
Errors	7,574.56	102	74.26		

[1] Covariate used was pre-tested Situational Test Anxiety.

Table 46

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND FOLLOW-UP-ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety Low	N	High	N
Pre	ACA	MH	47.60	10	45.57	7
		SH	40.33	15	50.17	12
		PC	50.91	35	48.70	30
Follow-up	ACA	MH	36.80	10	26.00	7
		SH	31.47	15	33.83	12
		PC	43.34	35	42.57	30

Table 47

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A).

Source of Variation	SS	df	MS	F	P
Treatment	1,949.33	2	974.67	10.56	.001
Covert Anxiety	315.99	1	315.99	3.42	.067
Treatment X Anxiety	339.34	2	169.67	1.84	.16
Covariate[1]	2,901.13	1	2,901.13	31.44	.001
Errors	9,411.06	102	92.27		

[1] Covariate used was pre-tested Anticipating Consequences Anxiety.

Table 48

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND FOLLOW-UP-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety Low	N	High	N
Pre	AEA	MH	21.00	10	25.14	7
		SH	22.27	15	27.42	12
		PC	24.31	35	22.50	30
Follow-up	AEA	MH	21.60	10	13.43	7
		SH	17.33	15	18.00	12
		PC	23.69	35	22.53	30

Table 49

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A).

Source	SS	df	MS	F	P
Treatment	904.06	2	452.03	11.52	.001
Covert Anxiety	339.78	1	339.78	8.66	.004
Treatment X Anxiety	331.46	2	165.73	4.22	.02
Covariate[1]	923.55	1	923.55	23.54	.001
Errors	4,001.57	102	39.23		

[1] Covariate used was pre-tested Authority Evaluation Anxiety.

Table 50

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUP BY LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A) ON PRE AND FOLLOW-UP-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES.

Administration	Scale	Treatment Group	Covert General Anxiety Low	N	High	N
Pre	PEA	MH	37.40	10	38.14	7
		SH	32.93	15	34.33	12
		PC	33.09	35	33.73	30
Follow-up	PEA	MH	27.30	10	19.00	7
		SH	23.13	15	22.00	12
		PC	30.17	35	30.43	30

Table 51

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH COVERT GENERAL ANXIETY (ASQ.A).

Source	SS	df	MS	F	P
Treatment	1,807.69	2	903.84	15.94	.001
Covert Anxiety	242.60	1	242.60	4.28	.04
Treatment X Anxiety	243.12	2	121.56	2.14	.12
Covariate[1]	1,485.56	1	1,485.56	26.20	.001
Errors	5,783.06	102	56.69		

[1] Covariate used was pre-tested Peer Evaluation Anxiety.

Table 52

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND FOLLOW-UP-ADMINISTERED TOTAL TEST ANXIETY (TTA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety: low	N	High	N
Pre	TTA	MH	103.14	7	116.42	12
		SH	97.67	15	122.33	12
		PC	109.13	31	114.49	37
Follow-up	TTA	MH	54.00	7	63.91	12
		SH	59.20	15	61.33	12
		PC	90.61	31	100.87	37

Table 53

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED TOTAL TEST ANXIETY (TTA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source of Variation	SS	df	MS	F	P
Treatment	32,702.18	2	16,351.08	19.05	.001
Overt Anxiety	1.75	1	1.75	0.01	.96
Treatment X Anxiety	1,584.04	2	792.02	0.92	.40
Covariate[1]	17,094.71	1	17,094.71	19.92	.001
Errors	91,817.81	107	858.11		

[1] Covariate used was pre-tested Total Test Anxiety.

Table 54

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND FOLLOW-UP-ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety: Low	N	High	N
Pre	STA	MH	49.00	7	51.08	10
		SH	49.25	16	54.55	11
		PC	50.72	29	52.03	36
Follow-up	STA	MH	31.60	7	33.83	10
		SH	53.00	16	35.91	11
		PC	45.21	29	48.17	36

Table 55

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED SITUATIONAL TEST ANXIETY (STA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source	SS	df	MS	F	P
Treatment	3,574.90	2	1,787.45	23.26	.001
Overt Anxiety	13.29	1	13.29	0.17	.68
Treatment X Anxiety	50.16	2	25.08	0.33	.72
Covariate[1]	545.26	1	545.26	7.09	.01
Errors	7,837.31	102	76.84		

[1] Covariate used was pre-tested Situational Test Anxiety.

Table 56

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND FOLLOW-UP-ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety Low	N	High	N
Pre	ACA	MH	41.00	7	49.17	10
		SH	39.75	16	51.91	11
		PC	49.28	29	50.39	36
Follow-up	ACA	MH	30.00	7	33.33	10
		SH	31.56	16	33.91	11
		PC	41.24	29	44.39	36

Table 57

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED ANTICIPATING CONSEQUENCES TEST ANXIETY (ACA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source	SS	df	MS	F	P
Treatment	1,616.15	2	808.07	8.54	.001
Overt Anxiety	9.84	1	9.84	0.10	.75
Treatment X Anxiety	195.10	2	97.55	1.03	.36
Covariate[1]	2,959.01	1	2,959.01	31.26	.001
Errors	9,656.13	102	94.67		

[1] Covariate used was pre-tested Anticipating Consequences Anxiety.

Table 58

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND FOLLOW-UP-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety Low	N	High	N
Pre	PEA	MH	31.40	7	40.33	10
		SH	33.00	16	34.36	11
		PC	31.45	29	34.94	36
Follow-up	PEA	MH	20.40	7	25.33	10
		SH	23.63	16	21.18	11
		PC	28.59	29	31.67	36

Table 59

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED PEER EVALUATION TEST ANXIETY (PEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source	SS	df	MS	F	P
Treatment	1,629.68	2	814.84	13.82	.001
Overt Anxiety	1.26	1	1.26	0.02	.88
Treatment X Anxiety	96.13	2	48.06	0.82	.45
Covariate[1]	1,268.74	1	1,268.74	21.52	.001
Errors	6,013.44	102	58.96		

[1] Covariate used was pre-tested Peer Evaluation Anxiety.

Table 60

MEANS OF MODIFIED, STANDARD HIERARCHY, AND CONTROL GROUPS BY LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B) ON PRE AND FOLLOW-UP-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES.

Administration	Scale	Treatment Group	Overt General Anxiety Low	N	High	N
Pre	AEA	MH	22.40	7	22.83	10
		SH	22.31	16	27.82	11
		PC	23.56	29	23.42	36
Follow-up	AEA	MH	15.80	7	19.25	10
		SH	18.19	16	16.82	11
		PC	23.35	29	23.00	36

Table 61

SUMMARY OF DIFFERENCES IN ANCOVA ON FOLLOW-UP-ADMINISTERED AUTHORITY EVALUATION TEST ANXIETY (AEA) SCORES FOUND BETWEEN TREATMENT GROUPS AND LOW AND HIGH OVERT GENERAL ANXIETY (ASQ.B).

Source	SS	df	MS	F	P
Treatment	907.54	2	453.77	10.72	.001
Overt Anxiety	2.88	1	2.88	0.07	.79
Treatment X Anxiety	131.55	2	65.78	1.55	.22
Covariate[1]	854.35	1	854.35	20.19	.001
Errors	4,315.72	102	42.31		

[1] Covariate used was per-tested Authority Evaluation Anxiety.